

(EEAP) BOILER AND CHILLER  
STUDY II

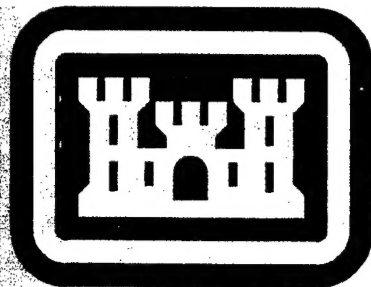
AT

FORT SAM HOUSTON

SAN ANTONIO, TEXAS

VOLUME II

PRE-FINAL



REPORT

**US ARMY CORPS  
OF ENGINEERS**

Fort Worth Division

19971023 103

CONDUCTED BY:

***HUITT ZOLLARS, INC.***

CONSULTING ENGINEERS

FORT WORTH, TEXAS

10/31/96

DISTRIBUTION STATEMENT A

Approved for public release;  
Distribution Unlimited




DEPARTMENT OF THE ARMY  
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS  
P.O. BOX 9005  
CHAMPAIGN, ILLINOIS 61826-9005

REPLY TO  
ATTENTION OF: TR-I Library

17 Sep 1997

Based on SOW, these Energy Studies are unclassified/unlimited.  
Distribution A. Approved for public release.

  
Marie Wakefield,  
Librarian Engineering

## APPENDIX H

### COMPUTER MODELING OF BOILER & CHILLER SYSTEMS

A. General Parameters. The following assumptions and estimates were used in the modeling of the existing buildings which are served by the boilers and chillers included in this study.

1. The Trace 600 weather data for San Antonio, Texas was used in all of the computer simulations.
2. The Trace 600 computer simulations were performed for the months of January through December to determine annual HVAC equipment energy consumptions.
3. A special holiday schedule was created to incorporate the additional holidays that military personnel living in the area 1300 barracks buildings receive. This schedule includes the seven standard holidays plus the period from December 17 through 31. The standard seven day holiday schedule was used for all other areas.
4. All building dimensions and construction data were determined from as-built drawings when available, or from field measurements taken during the site visit.
5. Design room temperatures for comfort conditions (thermostat setpoints) were obtained from CEMP-E (9 December 1991) Chapter 13, Section 3. These temperatures were 78°F, 50% relative humidity for cooling and 70°F for heating. No cooling or heating temperature setback control was included in the simulations. The design room conditions for the hospital were determined as follows:

Surgery / Critical Care	68 °F, 55%
Ancillary	72 °F, 50%
Nursing / Patient Care	76 °F, 50%
Computer Room	72 °F, 50%
6. The shading coefficient for all windows with interior shading devices was estimated at 0.67 per ASHRAE data.
7. The number of people in each building or room was estimated from interviews with post personnel or field notes taken during the site visit. The sensible and latent heat gain rates used for the people in each room were taken from ASHRAE data.
8. Building and room lighting loads were obtained from as-built drawings when available, or from field notes taken during the site visit. A diversity factor of 85% was utilized for lighting to estimate the energy consumption throughout the year.
9. Building and room miscellaneous equipment loads were estimated from field notes taken during the site visit. These loads represent the internal heat gains generated from equipment in the rooms, such as computers, televisions, cooking equipment, etc. Heat gain data for the various types of internal loads was taken from ASHRAE. A diversity factor of 50% was utilized for all miscellaneous loads to estimate the energy consumption throughout the year.
10. For all building with forced ventilation requirements, the ventilation rates used in the models were taken from the greater of the following:
  - a. ASHRAE Standard 62-1989

- b. Schedule data on the existing AHUs, FCUs, etc... (if available)
  - 11. Building 2288 was not modeled because it has been abandoned and committed to Congress for disposal at the time of the site visit.
  - 12. Diversity factors for both internal power (50%) and lighting (85%) was used to estimate the energy consumption of both types of equipment.
  - 13. In buildings where the plans did not show any insulation, 1" fibrous insulation was assumed.
- B. People, Lights and Miscellaneous Equipment Schedules. The following assumptions and estimates were used in the modeling of the existing buildings which are served by the boilers and chillers included in this study.
- 1. Offices: During the weekdays, all people, lights and miscellaneous equipment were scheduled at 100% from 8 am until 12 pm, and from 1 pm until 5 pm. During the lunch hour, from 12 pm until 1 pm, all internal loads were scheduled at 10%. On the weekends and holidays, all loads were scheduled at 0%.
  - 2. Barracks:
    - a. People - During the weekdays, all people were scheduled at 0% between 8 am and 5 pm. Between 5 pm and 10 pm, they were scheduled at 80%, and between 10 pm and 8 am, they were scheduled at 100%. During the weekends and holidays, the people were scheduled at 50% all day long.
    - b. Lights and Miscellaneous Equipment - During the weekdays, the lights and miscellaneous equipment (TVS, radios, etc.) were scheduled at 5% between 8 am and 5 pm. Between 5 pm and 10 pm, they were scheduled at 80%, and between 10 pm and 8 am, they were scheduled at 5%. During the weekends and holidays, the lights and miscellaneous equipment were scheduled at 50% from 8 am until 10 pm, and 5% from 10 pm until 8 am.
  - 3. Dining Areas:
    - a. People - During the weekdays, weekends and holidays, all people were scheduled at 100% between 6 am and 9 am, between 11 am and 2 pm, and between 5 pm and 7 pm. They were scheduled at 0% at all other times.
    - b. Lights and Miscellaneous Equipment - During the weekdays, weekends and holidays, all lights and miscellaneous equipment were scheduled at 100% between 5 am and 7 pm. They were scheduled at 0% at all other times.
  - 4. Kitchen Areas: During the weekdays, weekends and holidays, all people, lights and miscellaneous equipment were scheduled at 100% from 4 am until 9 pm. They were scheduled at 0% at all other times.
  - 5. Hospital: People, lights, and miscellaneous equipment were scheduled 100% for 24 hours/day, 365 days/year.



6. Chapels:

- a. People: On Sunday, all people were scheduled at 80% from 9 A.M. to 12 P.M. During the weekdays, all people were scheduled at 15% from 7 P.M. to 8 P.M. They were scheduled at 0% at all other times.
- b. Lights, and Miscellaneous equipment: On Sunday, all lights and miscellaneous equipment were scheduled at 100% from 9 A.M. to 12 P.M. and from 7 P.M. to 8 P.M. during the weekdays. They were scheduled 0% at all other times.

7. Theaters:

- a. People: All people were scheduled at 75% from 7 P.M. to 9 P.M. on Saturday. During the weekdays, all people were scheduled at 25% from 8 A.M. to 10 A.M. They were scheduled at 0% at all other times.
- b. Lights, and Miscellaneous equipment: All lights and miscellaneous equipment were scheduled at 100% from 7 P.M. to 9 P.M. on Saturdays and from 8 A.M. to 10 A.M. on the weekdays. They were scheduled 0% at all other times.

8. Grocery/Retail Areas:

- a. People: During the weekdays, all people were scheduled at 10% from 11 A.M. to 5 P.M. and 100 % from 5 P.M. to 8 P.M. On the weekends, all people were scheduled at 50% from 11 A.M. to 8 P.M. They were scheduled at 0% at all other times.
- b. Lights, and Miscellaneous equipment: During weekdays and weekends, all lights and miscellaneous equipment were scheduled at 100% from 11 A.M. to 8 P.M. They were scheduled 0% at all other times.

9. Museum:

- a. People: During the weekdays, all people were scheduled at 45% from 10 A.M. to 4 P.M. On the weekends, all people were scheduled at 100% from 10 A.M. to 4 P.M. They were scheduled at 0% at all other times.
- b. Lights, and Miscellaneous equipment: During weekdays and weekends, all lights and miscellaneous equipment were scheduled at 100% from 10 A.M. to 4 P.M. They were scheduled 0% at all other times.

10. Medical Library / Emergency Transport Area:

- a. People: During the weekdays and weekends, all people were scheduled at 100% from 7 A.M. to 5 P.M., 60% from 5 P.M. to 11 P.M., and 15% from 11 P.M. to 7 A.M.
- b. Lights, and Miscellaneous equipment: All lights and miscellaneous equipment were scheduled at 100% for 24 hours/day, 365 days/year.

11. Classrooms:

- a. People: During the weekdays, all people were scheduled at 100% from 8 A.M. to 10 A.M., and 50% from 1 P.M. to 2 P.M. They were scheduled at 0% at all other times.
- b. Lights, and Miscellaneous equipment: During the weekdays, all lighting and miscellaneous equipment were scheduled at 100% from 8 A.M. to 10 A.M., and from 1 P.M. to 2 P.M. They were scheduled 0% at all other times.

12. Lounge Areas:

- a. People: During the weekdays, all people were scheduled at 15% from 7 P.M. to 9 P.M. On the weekends, all people were scheduled at 75% from 7 P.M. to 12 A.M. They were scheduled at 0% at all other times.
- b. Lights, and miscellaneous equipment: During the weekdays, all lights and miscellaneous equipment were scheduled at 100% from 7 P.M. to 9 P.M. On the weekends, all lights and miscellaneous equipment were scheduled at 100% from 7 P.M. to 12 A.M. They were scheduled at 0% at all other times.

C. HVAC Equipment Schedules. The following assumptions and estimates were used in the modeling of the existing buildings which are served by the boilers and chillers included in this study.

1. All fan coil and air handler fans were scheduled to operate 100% of the day, 12 months of the year, as required by room thermostats to maintain building setpoint temperatures.
2. All fan coil and air handler cooling coils not serving areas that require year round cooling were scheduled to operate 100% of the day, from May through October, as required by room thermostats to maintain building setpoint temperatures.
3. All fan coil and air handler heating coils not serving areas that require year round heating were scheduled to operate 100% of the day, from November through April, as required by room thermostats to maintain building setpoint temperatures.
4. All building infiltration and ventilation air is scheduled to be introduced into the buildings at a fixed rate 100% of the day, 12 months per year.
5. All building and room thermostats were scheduled to maintain the design setpoints 24 hours per day, 12 months per year with no setback periods.

D. Building HVAC Systems. The following assumptions and estimates were used in the modeling of the existing buildings which are served by the boilers and chillers included in this study.

1. HVAC air system types were taken from building as-built drawings when available, or from field notes taken during the site visit.
2. In order to simplify the calculations, most buildings were modeled as a single 'zone' served by a single HVAC air system. Other buildings with more diverse occupancies were zoned as shown on as-built drawings or according to function and served by individual HVAC air systems in order to generate a more realistic load profile for the boilers and chillers.

3. The proposed building HVAC air system was assumed to have a chilled water coil for cooling and a heating water coil for heating. These coils were assumed to be served by two-pipe or four-pipe distribution systems within the buildings depending on the seasonal operation of the chillers & boilers.
  4. All fan motors were assumed to be 100% loaded with no power factor or efficiency adjustment.
  5. For all fans where the motor size was not available, the fan energy consumption was estimated at 0.000746 KW/CFM.
  6. One of the potential ECO's studied was to repair or retrofit the existing controls for the air systems. To simplify the analysis, there were five control strategies that were chosen in the model. The following are a list of the five air system control strategies:
    - a. Economizer: When the ambient temperature falls below 65°F, the O.A., return, and exhaust dampers are modulated between 100% OA intake and the minimum required for IAQ standards to maintain a mixed air temperature set-point.
    - b. Setback: When the occupancy of the area being served by the air system falls below 5%, the heating and cooling space temperature set-point is setback. For the cooling mode, the setpoint falls back to 90°, and in the heating set-point, the temperature is setback to 65°F.
    - c. Hot deck reset: the HW coil is modulated to maintain a leaving air temperature set-point that varies between 70°F and 110°F according to the outdoor ambient temperature.
    - d. Cold deck reset: the CHW coil is modulated to maintain a leaving air temperature set-point that varies between 53°F and 60°F according to the outdoor ambient temperature.
    - e. Optimum Start/Stop: the air system fan is energized at a certain time before occupancy which is calculated by multiplying the number of minutes required to change the space temperature one degree by the number of degrees away from the space temperature set-point.
- E. Boiler & Chiller Systems. The following assumptions and estimates were used in the modeling of the boiler and chiller systems included in this study.
1. Boiler and chiller systems types, full load capacity, and energy consumption were identified during the field inspection and used in the computer simulations for modeling the existing equipment. The Trace 600 models were used for part load performance of these boilers and chillers.
  2. It was assumed that all existing chillers had a full load KW/ton increase of 1% over their original rating for each year of service up to ten years. For all service over ten years, 0.25% per year was added to the full load KW/ton rating. This was done to account for natural efficiency losses due to tube fouling and compressor wear.
  3. It was assumed that all existing boilers had a full load efficiency decrease of 1% under their original rating for each year of service up to ten years. For all service over ten years, 0.25%

per year was deducted from the full load efficiency rating. This was done to account for natural efficiency losses due to tube fouling and burner wear.

4. All pump motors were assumed to be 100% loaded with no power factor or efficiency adjustment
5. Pumping horsepower for all associated pumps was estimated for all proposed boilers and chillers and input to simulate the new systems.
6. Existing cooling tower systems were identified during the field inspection and used in the computer simulations for the existing equipment. The existing towers were also used for the proposed equipment wherever possible. Their fan horsepower was also input to simulate the existing towers.
7. In all areas, a base load was added to the existing and proposed chillers and boilers to account for heat loss or gain from circulating pumps and piping insulation. These base loads increased the required capacity of the boilers and chillers and show up as 'base utility' in the equipment energy consumption output sheets.
8. In buildings where existing heating equipment information was unavailable, a heating load of 0.009 MBH/sq ft was estimated with a 50% safety factor added to determine the size of the equipment.
9. The age of the equipment, if not available, was estimated from field notes taken during the site visit.
10. If existing chiller information was not available, it was assumed that all chillers were selected at 105°F ambient temperature with a 44°F CHW supply temperature.
11. Building 1001 is served from the chiller in building 1002 which was not included in the Scope of Work. Therefore, a "substitute" chiller with the same full load efficiency as the chiller serving both buildings 1001 and 1002 was used to serve just building 1001. The percentage that this "substitute" chiller was loaded was estimated from the percentage that the actual chiller is loaded. This estimation was calculated by assuming 650 sq ft/ton for building 1002 and adding that to the computer simulated load for building 1001.
12. Proposed boiler and chiller alternatives were selected for comparison in the computer simulations. Full load capacity and energy consumption rates were obtained from manufacturer's data and input into the computer simulations. When available, part load energy consumption data from the manufactures was used in the simulations.
13. All proposed chillers were selected from the top 25% of their class in terms of efficiency (KW/ton), and also were at least 10% more efficient than current design standards.
14. In addition to the air system control packages, the proposed boiler and chiller equipment was also modeled with control strategies where applicable. The following are a list of the water system control strategies used in the model:
  - a. Sequencing: In areas where more than one chiller was selected to handle the load, chiller sequencing was modeled to obtain the optimum efficiency at all part load conditions. This also required selecting the chillers to operate at the best efficiency points at the greatest percentage of time.

- b. CHW/HW reset: The chilled/heating water supply temperature was reset according to the part load ratio of the chiller/boiler. At 80% part load, the chilled/heating water supply temperature was reset to 2°F above/below design temperature. At 40% part load, the chilled/heating water temperature was reset to a maximum value of 4°F above/below design temperature.
- c. CND reset: The condenser water supply temperature was reset according to ambient air temperatures. In supplying CND water lower than 85°F, this decreases the pressure differential between the evaporator and condenser which results in the compressor doing less work.

## 01 Card - Job Information

-----

Project: 030185.06 EEAP BOILER-CHILLER STUDY  
 Location: FT. SAM HOUSTON, TEXAS  
 Client: CORPS. OF ENGINEERS - FORT WORTH, TX.  
 Program User: HUITT-ZOLLARS INC.  
 Comments: AREA 100

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## Card 11----- Energy Simulation Parameters -----

1st Month	Last Month	Level		Building
Energy	Energy	Of	Holiday	Calendar
Simulation	Simulation	Calculation	Code	Code
ZONE				

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	EXISTING BUILDINGS

## Card 20----- General Room Parameters -----

Room	Zone						Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth
	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	
5	5	BLDG 122	113	113	3	3	2.54	11			
6	6	BLDG 140	50	26	3	5	2.54	15			
10	10	BLDG 124	113	113	3	3	2.54	11			
15	15	BLDG 128	119	119	3	8	2.54	18			
20	20	BLDG 133	100	96	3	8	2.54	18			
25	25	BLDG 134	102	102	3	3	2.54	12			
30	30	BLDG 143	122	122	3	3	2.54	12			
35	35	BLDG 144	122	122	3	3	2.54	12			
40	40	BLDG 145	122	122	3	3	2.54	12			



## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
45	45	BLDG 146	122	122	3	3	2.54	12			
50	50	BLDG 147	122	122	3	3	2.54	12			
55	55	BLDG 149	122	122	3	3	2.54	12			
60	60	BLDG 197	122	122	3	3	2.54	12			
65	65	BLDG 198	68	68	3	5	2.54	14			
70	70	BLDG 199	80	80	3	2	2.54	12			
75	75	BLDG 125	50	26	3	5	2.54	15			
80	80	BLDG 127	50	26	3	5	2.54	15			
85	85	BLDG 135	50	26	3	5	2.54	15			
90	90	BLDG 250-1	142	34	3	2	2.54	10.5			
95	95	BLDG 250-2	195	195	3	2	2.54	10.5			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
5	78	50	78		70	70		ROOM	LIGHT30	NO
6	78	50	78		70	70		ROOM	LIGHT30	YES
10	78	50	78		70	70		ROOM	LIGHT30	NO
15	78	50	78		70	70		ROOM	LIGHT30	NO
20	78	50	78		70	70		ROOM	LIGHT30	NO
25	78	50	78		70	70		ROOM	LIGHT30	NO
30	78	50	78		70	70		ROOM	LIGHT30	NO
35	78	50	78		70	70		ROOM	LIGHT30	NO
40	78	50	78		70	70		ROOM	LIGHT30	NO
45	78	50	78		70	70		ROOM	LIGHT30	NO
50	78	50	78		70	70		ROOM	LIGHT30	NO
55	78	50	78		70	70		ROOM	LIGHT30	NO
60	78	50	78		70	70		ROOM	LIGHT30	NO
65	78	50	78		70	70		ROOM	LIGHT30	NO
70	78	50	78		70	70		ROOM	LIGHT30	NO
75	78	50	78		70	70		ROOM	LIGHT30	NO
80	78	50	78		70	70		ROOM	LIGHT30	NO
85	78	50	78		70	70		ROOM	LIGHT30	NO
90	78	50	78		70	70		ROOM	LIGHT30	NO
95	78	50	78		70	70		ROOM	LIGHT30	NO

## Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	NO	180	30	.08	37	0	60	
6	1	YES			0.08	40		60	

## Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
10	1	NO	180	30	.08	37	0	60	
15	1	YES			.08	37	0	60	
20	1	YES			.08	37	0	60	
25	1	NO	73	74	.05	40	0	45	
30	1	NO	146	28	.05	40	0	80	
35	1	NO	146	28	.05	40	0	80	
40	1	NO	146	28	.05	40	0	80	
45	1	NO	146	28	.05	40	0	80	
50	1	NO	146	28	.05	40	0	80	
55	1	NO	146	28	.05	40	0	80	
60	1	NO	146	28	.05	40	0	80	
65	1	NO	39	39	.08	37	0	60	
70	1	NO	56	57	.05	37	0	60	
75	1	YES			.08	37	0	60	
80	1	YES			.08	37	0	60	
85	1	YES			.08	37	0	60	
90	1	YES			.06	23	0	90	
95	1	NO	113	113	.06	23	0	90	

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
5	1	360	11	.17	58	330			
5	2	60	11	.17	58	60			
5	3	360	11	.17	58	150			
5	4	60	11	.17	58	240			
6	1	50	15	0.17	64	315			
6	2	26	15	0.17	64	45			
6	3	50	15	0.17	64	135			
6	4	26	15	0.17	64	225			
10	1	360	11	.17	58	315			
10	2	60	11	.17	58	45			
10	3	360	11	.17	58	135			
10	4	60	11	.17	58	225			
15	1	100	18	.10	58	315			
15	2	96	18	.10	58	45			
15	3	100	18	.10	52	135			
15	4	96	18	.10	58	225			
20	1	100	18	.10	58	330			
20	2	96	18	.10	58	60			
20	3	100	18	.10	52	150			
20	4	96	18	.10	58	240			
25	1	280	12	.11	88	315			
25	2	60	12	.11	88	45			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc	Type	Direction	Tilt	Alpha
									Reflectance
									Multiplier
25	3	280	12	.11	88		135		
25	4	60	12	.11	88		225		
30	1	292	12	.10	58		0		
30	2	56	12	.10	58		90		
30	3	292	12	.10	58		180		
30	4	56	12	.10	58		270		
35	1	292	12	.10	58		0		
35	2	56	12	.10	58		90		
35	3	292	12	.10	58		180		
35	4	56	12	.10	58		270		
40	1	292	12	.10	58		0		
40	2	56	12	.10	58		90		
40	3	292	12	.10	58		180		
40	4	56	12	.10	58		270		
45	1	292	12	.10	58		0		
45	2	56	12	.10	58		90		
45	3	292	12	.10	58		180		
45	4	56	12	.10	58		270		
50	1	292	12	.10	58		90		
50	2	56	12	.10	58		180		
50	3	292	12	.10	58		270		
50	4	56	12	.10	58		0		
55	1	292	12	.10	58		90		
55	2	56	12	.10	58		180		
55	3	292	12	.10	58		270		
55	4	56	12	.10	58		0		
60	1	292	12	.10	58		320		
60	2	56	12	.10	58		50		
60	3	292	12	.10	58		140		
60	4	56	12	.10	58		230		
65	1	27.5	14	.12	74		0		
65	2	59	14	.12	74		90		
65	3	27.5	14	.12	74		180		
65	4	59	14	.12	74		270		
70	1	126	12	.12	74		315		
70	2	31	12	.12	74		45		
70	3	126	12	.12	74		135		
70	4	31	12	.12	74		225		
75	1	50	15	.17	58		315		
75	2	26	15	.17	58		45		
75	3	50	15	.17	58		135		
75	4	26	15	.17	58		225		
80	1	50	15	.17	58		315		
80	2	26	15	.17	58		45		
80	3	50	15	.17	58		135		
80	4	26	15	.17	58		225		
85	1	50	15	.17	58		315		

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
85	2	26	15	.17	58	45			
85	3	50	15	.17	58	135			
85	4	26	15	.17	58	225			
90	1	142	10.5	.12	74	0			
90	2	58	10.5	.12	74	90			
90	3	52	10.5	.12	74	180			
90	4	58	10.5	.12	74	270			
95	1	20	10.5	.12	74	0			
95	2	798	10.5	.12	74	90			
95	3	60	10.5	.12	74	180			
95	4	798	10.5	.12	74	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows					Solar to Ret. Air	Visible Transmittance	
5	1	5	3	34	1.1	.67					
5	2	5	3	6	1.1	.67					
5	3	5	3	34	1.1	.67	3				
5	4	5	3	6	1.1	.67					
6	1	8	3	4	0.73	0.67					
6	2	8	3	4	0.73	0.67					
6	3	8	3	4	0.73	0.67					
6	4	8	3	2	0.73	0.67					
10	1	5	3	34	1.1	.67					
10	2	5	3	6	1.1	.67					
10	3	5	3	34	1.1	.67	3				
10	4	5	3	6	1.1	.67					
15	1	7	3	8	1.1	.67	3				
15	2	7	3	7	1.1	.67					
15	3	7	3	9	1.1	.67					
15	4	7	3	7	1.1	.67					
20	1	7	3	8	1.1	.67	3				
20	2	7	3	7	1.1	.67					
20	3	7	3	9	1.1	.67					
20	4	7	3	7	1.1	.67					
25	1	6	3	26	.8	.67					
25	2	6	3	5	.8	.67					
25	3			29	.53	1					
25	4	6	3	5	.8	.67					
30	1	7	3.5	21	1.1	.67	3				
30	2	7	3.5	6	1.1	.67					
30	3			35	1.1	.67	3				
30	4	7	3.5	6	1.1	.67					
35	1	7	3.5	21	1.1	.67	3				

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
35	2	7	3.5	6	1.1	.67					
35	3			35	1.1	.67	3				
35	4	7	3.5	6	1.1	.67					
40	1	7	3.5	21	1.1	.67	3				
40	2	7	3.5	6	1.1	.67					
40	3			35	1.1	.67	3				
40	4	7	3.5	6	1.1	.67					
45	1	7	3.5	21	1.1	.67	3				
45	2	7	3.5	6	1.1	.67					
45	3			35	1.1	.67	3				
45	4	7	3.5	6	1.1	.67					
50	1	7	3.5	21	1.1	.67	3				
50	2	7	3.5	6	1.1	.67					
50	3			35	1.1	.67	3				
50	4	7	3.5	6	1.1	.67					
55	1	7	3.5	21	1.1	.67	3				
55	2	7	3.5	6	1.1	.67					
55	3			35	1.1	.67	3				
55	4	7	3.5	6	1.1	.67					
60	1	7	3.5	21	1.1	.67	3				
60	2	7	3.5	6	1.1	.67					
60	3			35	1.1	.67	3				
60	4	7	3.5	6	1.1	.67					
65	1	5	3	6	1.1	.67					
65	2	5	3	11	1.1	.67	3				
65	3	5	3	6	1.1	.67					
65	4	5	3	11	1.1	.67	3				
70	1	5	3	10	1.1	.67	3				
70	2	5	3	2	1.1	.67					
70	3	5	3	10	1.1	.67					
70	4	5	3	2	1.1	.67					
75	1	8	3	4	.73	.67					
75	2	8	3	2	.73	.67					
75	3	8	3	4	.73	.67					
75	4	8	3	2	.73	.67					
80	1	8	3	4	.73	.67					
80	2	8	3	2	.73	.67					
80	3	8	3	4	.73	.67					
80	4	8	3	2	.73	.67					
85	1	8	3	4	.73	.67					
85	2	8	3	2	.73	.67					
85	3	8	3	4	.73	.67					
85	4	8	3	2	.73	.67					
90	1	4	2	3	1.1	1					
90	3	7	5	3	1.1	1					
90	4	7	5	3	1.1	1					
95	2	4	2	114	1.1	.67					

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
				or No. of Windows	Glass U-Value						
95	3	4	2	6	1.1	.67					
95	4	4	2	114	1.1	.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHOFFIC	FSHOFFIC								
6	FSHOFFIC	FSHOFFIC								
10	FSHOFFIC	FSHOFFIC								
15	FSHOFFIC	FSHOFFIC								
20	FSHOFFIC	FSHOFFIC								
25	FSHOFFIC	FSHOFFIC								
30	FSHOFFIC	FSHOFFIC								
35	FSHOFFIC	FSHOFFIC								
40	FSHOFFIC	FSHOFFIC								
45	FSHOFFIC	FSHOFFIC								
50	FSHBARRP	FSHBARRL								
55	FSHBARRP	FSHBARRL								
60	FSHOFFIC	FSHOFFIC								
65	FSHOFFIC	FSHOFFIC								
70	FSHOFFIC	FSHOFFIC								
75	FSHOFFIC	FSHOFFIC								
80	FSHOFFIC	FSHOFFIC								
85	FSHOFFIC	FSHOFFIC								
90	FSHOFFIC	FSHOFFIC								
95	FSHBARRP	FSHBARRL								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
										Reference Point 1	Reference Point 2
5	60	PEOPLE	250	200	2	WATT-SF	ASHRAE2				
6	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2				
10	60	PEOPLE	250	200	2	WATT-SF	ASHRAE2				
15	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
20	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
25	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
30	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
35	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
40	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
45	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
50	45	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
55	45	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				



## Card 27----- People and Lights -----

							Lighting		Percent	---	Daylighting	----
Room	People	People	People	People	Lighting	Lighting	Fixture	Ballast	Lights to	Reference	Reference	
Number	Value	Units	Sensible	Latent	Value	Units	Type	Factor	Ret. Air	Point 1	Point 2	
60	250	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2					
65	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2					
70	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2					
75	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2					
80	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2					
85	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2					
90	160	SF-PERS	250	200	2	WATT-SF	INCAND					
95	160	SF-PERS	250	200	1.5	WATT-SF	INCAND					

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Number	Descrip									
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
6	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE					
10	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
15	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
20	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
30	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
40	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
45	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
50	1	T.V.-ETC.	1	WATT-SF	FSHBARRL	NONE					
55	1	T.V.-ETC.	1	WATT-SF	FSHBARRL	NONE					
60	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
65	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
70	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
75	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
80	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
85	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
90	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
95	1	COMPUTER	1	WATT-SF	FSHBARRL	NONE					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		Value	Units
5	20	CFM-P	20	CFM-P						
6	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	20	CFM-P	20	CFM-P						

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	15	CFM-P	15	CFM-P						
55	15	CFM-P	15	CFM-P						
60	20	CFM-P	20	CFM-P						
65	20	CFM-P	20	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	20	CFM-P	20	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						
95	20	CFM-P	20	CFM-P						

Card 32----- Exposed Floor Parameters-----										
Exposed				-----Exposed Floor-----						
Room	Floor	Perimeter	Loss	Floor	Floor	Const	Temp	Cooling	Heating	Adjacent
Number	Number	Length	Coefficient	Area	U-Value	Type	Flag	Temp	Temp	Room No
5	1			5400	.19	119	HRLYOADB			
10	1			5400	.19	119	HRLYOADB			
15	1			14224	.19	119	HRLYOADB			
20	1			9600	.19	119	HRLYOADB			
50	1			5400	.19	119	HRLYOADB			
55	1			5400	.19	119	HRLYOADB			
70	1			3906	.25	119	HRLYOADB			

Card 33----- External Shading -----										
-----OVERHANG-----				-----VERTICAL FINS-----						
		Height				Left		Right		Adjacent
Shading	Glass	Above	Projection	Glass	Projection	Projection	Projection	Projection	Projection	Building
Type	Height	Glass	Out	Width	Left	Out	Right	Out	Out	Flag
3	5	2	8							

----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	AREA 100 EXISTING SYSTEMS

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System	Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
	Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
	1	MZ						
	2	SZ						
	3	MZ						
	4	MZ						
	5	MZ						
	6	MZ						
	7	MZ						
	8	MZ						
	9	PTAC						
	10	SZ						
	11	MZ						
	12	MZ						
	13	SZ						
	14	SZ						
	15	MZ						
	16	FC						
	17	SZ						
	18	SZ						
	19	MZ						
	20	MZ						

Card 41----- Zone Assignment -----

System

Set	Ref #1	Ref #2	Ref #3	Ref #4	Ref #5	Ref #6
Number	Begin	End	Begin	End	Begin	End
1	5	5				
2	6	6				
3	10	10				
4	15	15				
5	20	20				
6	25	25				
7	30	30				
8	35	35				
9	40	40				
10	45	45				
11	50	50				
12	55	55				
13	60	60				
14	65	65				
15	70	70				
16	75	75				
17	80	80				
18	85	85				
19	90	90				

## Card 41----- Zone Assignment -----

System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
20	95	95										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1										
2	1										
3	1										
4	2.3										
5	2.3										
6	1.5										
7	1.4										
8	1.4										
9	.5										
10	1.4										
11	1.4										
12	1.4										
13	1.4										
14	1.5										
15	1.5										
16	1										
17	1										
18	1										
19	2.5										
20	2.5										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	OFF					OFF	OFF	OFF		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
6	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
12	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main		Auxiliary
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech. Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity Coil
13	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
14	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
15	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
16	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
17	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
18	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
19	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
20	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand		Demand Limit
Number	Time of Day	Time of Day	Limit	Alternative Description	Temperature
	Schedule	Schedule	Max KW		Drift
1				BASE CASE	

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	BLKPLANT	1 2									
2	2	BLKPLANT	3 3	16 16								
3	3	BLKPLANT	4 4									
4	4	BLKPLANT	5 5									
5	5	BLKPLANT	6 6	18 18								
6	6	BLKPLANT	7 7									
7	7	BLKPLANT	8 8									
8	9	BLKPLANT	9 9									
9	10	BLKPLANT	10 10									
10	11	BLKPLANT	11 12									
11	12	BLKPLANT	13 13									
12	13	BLKPLANT	14 14									
13	14	BLKPLANT	15 15									
14	15	BLKPLANT	17 17									
15	16	BLKPLANT	19 20									

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order Seq	Limit
Num Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num Type	Number
1 ACC2	1	40	TONS	70.4	KW						

Card 62----- Cooling Equipment Parameters -----												
Cool Equip	Num	-----COOLING-----					-----HEAT RECOVERY-----				Seq	Demand
Ref Code	Of	--Capacity--		----Energy----			--Capacity--		----Energy----		Order	Seq Limit
Num Name	Units	Value	Units	Value	Units		Value	Units	Value	Units	Num	Type Number
2 ACC2	1	50	TONS	88	KW							
3 ACC2	1	40	TONS	70.4	KW							
4 ACC1	1	25	TONS	44	KW							
5 ACC1	1	30	TONS	52.8	KW							
6 ACC2	1	45	TONS	79.2	KW							
7 ACC1	1	4	TONS	5.81	KW						1	PAR
8 ACC2	1	45	TONS	79.2	KW						2	PAR
9 EQ1307	1	46	TONS	55.0	KW							
10 ACC1	1	40	TONS	70.4	KW							
11 ACC2	1	50	TONS	88	KW							
12 ACC2	1	50	TONS	88	KW							
13 EQ1113	1	10	TONS	14.4	KW							
14 ACC1	1	15	TONS	26.4	KW							
15 EQ1161	1	4.5	TONS	7.0	KW							
16 ACC2	1	100	TONS	176	KW							

Card 63----- Cooling Pumps and References -----										
Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	2.24	KW								3
2	2.24	KW								5
3	1.12	KW								
4	1.12	KW								
5	.37	KW								
6	2.24	KW								
7	2.24	KW								
8	2.24	KW								
10	1.12	KW								
11	3.73	KW								
12	1.49	KW								
13	1.12	KW								
14	1.49	KW								
16	5.6	KW								

Card 65----- Heating Load Assignment -----										
Load	All Coil									
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	1 2								
2	2	3 3								



## Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
3	3	4	4								
4	4	5	5								
5	5	6	6	18	18						
6	6	7	7								
7	7	8	8								
8	8	9	9								
9	9	10	10								
10	10	11	11								
11	11	12	12								
12	12	13	13								
13	13	14	14								
14	14	15	15								
15	15	17	17								
16	16	19	20								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot Strg	Misc. Acc.	Cogen	Demand Limit			
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILERWT	1	1.12	KW	618	MBH	850	MBH				2		
2	BOILERWT	1	1.12	KW	618	MBH	850	MBH				4		
3	BOILERWT	1	0.37	KW	109	MBH	150	MBH						
4	BOILERWT	1	.37	KW	109	MBH	150	MBH				1		
5	BOILERWT	1	.37	KW	596	MBH	820	MBH						
6	BOILERWT	1	.75	KW	596	MBH	820	MBH						
7	BOILERWT	1	.75	KW	596	MBH	820	MBH						
8	EQ2263	1			515.2	MBH	53.59	KW						
9	BOILERWT	1	.75	KW	596	MBH	820	MBH						
10	BOILERWT	1	.75	KW	596	MBH	820	MBH						
11	BOILERWT	1	.75	KW	596	MBH	820	MBH						
12	BOILERWT	1	.75	KW	1273	MBH	1750	MBH						
13	BOILERWT	1	.56	KW	327	MBH	450	MBH						
14	BOILERWT	1	1.12	KW	145	MBH	200	MBH						
15	EQ2454	1			33	MBH	45	MBH						
16	STEAMBLR	1			727	MBH	1000	MBH	1					

## Card 69----- Fan Equipment Parameters -----

System Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						

## Card 69----- Fan Equipment Parameters -----

## System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						
10	TYPFAN						
11	TYPFAN						
12	TYPFAN						
13	TYPFAN						
14	TYPFAN						
15	TYPFAN						
16	TYPFAN						
17	TYPFAN						
18	TYPFAN						
19	TYPFAN						
20	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	8.2											
2	0.7											
3	8.2											
5	7.5											
6	8.2											
11	7.5											
12	7.5											
13	6.7											
17	2.2											
19	5.6											
20	34.0											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP HT LOS	1.27	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE HT LOS	7.35	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP HT LOS	1.32	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE HT LOSS	7.36	MBH	FTSAMHTG	HOT-LD	2			



## 01 Card - Job Information

-----

Project: 030185.06 EEAP BOILER-CHILLER STUDY  
 Location: FT. SAM HOUSTON, TEXAS  
 Client: CORPS. OF ENGINEERS - FORT WORTH, TX.  
 Program User: HUITT-ZOLLARS INC.  
 Comments: AREA 100

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## Card 11----- Energy Simulation Parameters -----

1st Month	Last Month	Level		Building
Energy	Energy	Of	Holiday	Calendar
Simulation	Simulation	Calculation	Code	Code
				Area
				ZONE

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	EXISTING BUILDINGS

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
100	100	BLDG. 142	65	65	3	2	2.54	10			
105	105	BLDG. 123	72	72	3	10	2.54	24			
110	110	BLDG. 126	94.5	94.5	3	2	2.54	12			
115	115	BLDG. 131	94.5	94.5	3	2	2.54	12			
125	125	BLDG. 129	97	97	3	3	2.54	12			
130	130	BLDG. 151	40	40.5	3	1	2.54	11			
135	135	BLDG. 154	40	40.5	3	1	2.54	11			
140	140	BLDG. 156	40	40.5	3	1	2.54	11			
145	145	BLDG. 157	40	40.5	3	1	2.54	11			

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
150	150	BLDG. 159	40	40.5	3	1	2.54	11			
155	155	BLDG. 152 ADMIN	44.5	44.5	3	2.5	2.54	15			
160	160	BLDG. 152 CLASS	46	46	3	2.5	2.54	15			
165	165	BLDG. 155	90.5	91	3	2.5	2.54	15			
170	170	BLDG. 158	64	64	3	2.5	2.54	15			
175	175	BLDG. 141	31.2	32	3	2	2.54	12			
180	180	BLDG. 260	41.5	42	3	2	2.54	12			
185	185	BLDG. 261	39.5	39.5	3	2	2.54	12			
190	190	BLDG. 268	92	92	3	3	2.54	12			

## Card 21----- Thermostat Parameters -----

Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
100	78	50	78		70	70		ROOM	LIGHT30	YES
105	78	50	78		70	70		ROOM	LIGHT30	YES
110	78	50	78		70	70		ROOM	LIGHT30	YES
115	78	50	78		70	70		ROOM	LIGHT30	YES
125	78	50	78		70	70		ROOM	LIGHT30	YES
130	78	50	78		70	70		ROOM	LIGHT30	YES
135	78	50	78		70	70		ROOM	LIGHT30	YES
140	78	50	78		70	70		ROOM	LIGHT30	YES
145	78	50	78		70	70		ROOM	LIGHT30	YES
150	78	50	78		70	70		ROOM	LIGHT30	YES
155	78	50	78		70	70		ROOM	LIGHT30	YES
160	78	50	78		70	70		ROOM	LIGHT30	YES
165	78	50	78		70	70		ROOM	LIGHT30	YES
170	78	50	78		70	70		ROOM	LIGHT30	YES
175	78	50	78		70	70		ROOM	LIGHT30	YES
180	78	50	78		70	70		ROOM	LIGHT30	YES
185	78	50	78		70	70		ROOM	LIGHT30	YES
190	78	50	78		70	70		ROOM	LIGHT30	YES

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to	Length	Width	U-Value	Type	Direction	Tilt	Alpha
		Floor?							
100	1	NO	47	33	0.05	40	0	80	
105	1	YES			0.05	40		75	
110	1	YES			0.08	40		75	
115	1	YES			0.08	40		75	
125	1	NO	69	69	0.05	40		45	
130	1	YES			0.08	40		60	

## Card 22----- Roof Parameters -----

Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
135	1	YES			0.08	40		60	
140	1	YES			0.08	40		60	
145	1	YES			0.08	40		60	
150	1	YES			0.08	40		60	
155	1	YES			0.08	40		60	
160	1	YES			0.08	40		60	
165	1	NO	64	64	0.08	40		60	
170	1	YES			0.08	40		60	
175	1	NO	22.5	22.5	0.08	40		45	
180	1	YES			0.08	40		60	
185	1	YES			0.08	40		60	
190	1	YES			0.08	40		65	

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance	Multiplier
100	1	118	10	.16	64	0				
100	2	83	10	.16	64	90				
100	3	118	10	.16	64	180				
100	4	83	10	.16	64	270				
105	1	115	14	.014	64	0				
105	2	135	14	0.14	64	90				
105	3	115	14	0.14	64	180				
105	4	134	14	0.14	64	270				
110	1	292	12	0.14	64	225				
110	2	60	12	0.14	64	315				
110	3	292	12	0.14	64	45				
110	4	60	12	0.14	64	135				
115	1	292	12	0.14	64	225				
115	2	60	12	0.14	64	315				
115	3	292	12	0.14	64	45				
115	4	60	12	0.14	64	135				
125	1	308	12	0.11	64	0				
125	2	77	12	0.11	64	90				
125	3	308	12	0.11	64	180				
125	4	77	12	0.11	64	270				
130	1	41	12	0.14	64	0				
130	2	39	12	0.14	64	90				
130	3	42	12	0.14	64	180				
130	4	39	12	0.14	64	270				
135	1	41	12	0.14	64	0				
135	2	39	12	0.14	64	90				
135	3	42	12	0.14	64	180				
135	4	39	12	0.14	64	270				



## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Ground			
Number	Number	Length	Height	U-Value	Constuc	Wall	Wall	Wall	Reflectance
					Type	Direction	Tilt	Alpha	Multiplier
140	1	41	12	0.14	64	0			
140	2	39	12	0.14	64	90			
140	3	42	12	0.14	64	180			
140	4	39	12	0.14	64	270			
145	1	39	12	0.14	64	0			
145	2	42	12	0.14	64	90			
145	3	39	12	0.14	64	180			
145	4	42	12	0.14	64	270			
150	1	39	12	0.14	64	0			
150	2	42	12	0.14	64	90			
150	3	39	12	0.14	64	180			
150	4	42	12	0.14	64	270			
155	1	70	13	0.14	64	0			
155	2	70	13	0.14	64	180			
160	1	40	13	0.14	64	0			
160	2	53	13	0.14	64	90			
160	3	40	13	0.14	64	180			
160	4	53	13	0.14	64	270			
165	1	110	13	0.14	64	0			
165	2	53	13	0.14	64	90			
165	3	40	13	0.14	64	180			
165	4	53	13	0.14	64	270			
170	1	53	13	0.14	64	0			
170	2	110	13	0.14	64	90			
170	3	53	13	0.14	64	180			
170	4	40	13	0.14	64	270			
175	1	36	12	0.14	64	0			
175	2	56	12	0.14	64	90			
175	3	36	12	0.14	64	180			
175	4	56	12	0.14	64	270			
180	1	33	12	0.14	64	0			
180	2	53.5	12	0.14	64	90			
180	3	33	12	0.14	64	180			
180	4	53.5	12	0.14	64	270			
185	1	35	12	0.14	64	0			
185	2	44	12	0.14	64	90			
185	3	35	12	0.14	64	180			
185	4	44	12	0.14	64	270			
190	1	136	12	0.14	64	0			
190	2	71	12	0.14	64	90			
190	3	136	12	0.14	64	180			
190	4	71	12	0.14	64	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
100	1	5	3.5	5	1.1	0.67					
100	2	5	3.5	6	1.1	0.67					
100	3	5	3.5	7	1.1	0.67					
100	4	5	3.5	6	1.1	0.67					
105	1	3	7.5	10	1.1	0.67		3			
105	2	3	7.5	11	1.1	0.67					
105	3	3	7.5	9	1.1	0.67					
105	4	3	7.5	11	1.1	0.67					
110	1	8	4	25	1.1	0.67					
110	2	8	4	4	1.1	0.67					
110	3	8	4	22	1.1	0.67		3			
110	4	8	4	4	1.1	0.67					
115	1	8	4	25	1.1	0.67					
115	2	8	4	4	1.1	0.67					
115	3	8	4	22	1.1	0.67		3			
115	4	8	4	4	1.1	0.67					
125	1	8	4	25	1.1	1					
125	2	8	4	4	1.1	1					
125	3	8	4	22	1.1	1					
125	4	8	4	4	1.1	1					
130	1	4	2	4	1.1	0.67					
130	2	4	2	4	1.1	0.67					
130	3	4	2	5	1.1	0.67					
130	4	4	2	3	1.1	0.67					
135	1	4	2	4	1.1	0.67					
135	2	4	2	4	1.1	0.67					
135	3	4	2	5	1.1	0.67					
135	4	4	2	3	1.1	0.67					
140	1	4	2	4	1.1	0.67					
140	2	4	2	4	1.1	0.67					
140	3	4	2	5	1.1	0.67					
140	4	4	2	3	1.1	0.67					
145	1	4	2	3	1.1	0.67					
145	2	4	2	4	1.1	0.67					
145	3	4	2	3	1.1	0.67					
145	4	4	2	5	1.1	0.67					
150	1	4	2	3	1.1	0.67					
150	2	4	2	4	1.1	0.67					
150	3	4	2	3	1.1	0.67					
150	4	4	2	5	1.1	0.67					
155	1	6	3	6	1.1	1		3			
155	2	6	3	6	1.1	1		3			
160	1	6	3	6	1.1	1		3			
160	2	6	3	4	1.1	1					
160	3	6	3	4	1.1	1					
160	4	6	3	5	1.1	1					
165	1	8	3	10	1.1	1		3			
165	2	8	3	5	1.1	1					
165	3	8	3	4	1.1	1					
165	4	8	3	5	1.1	1					
170	1	8	3	5	1.1	1					

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
170	3	8	3	5	1.1	0.67					
170	4	8	3	4	1.1	0.67					
175	1	8	2	3	1.1	0.67					
175	2	8	2	6	1.1	0.67					
175	3	8	2	2	1.1	0.67					
175	4	8	2	6	1.1	0.67					
180	1	6	3	4	1.1	1					
180	2	6	3	2	1.1	1					
180	3	6	3	2	1.1	1	3				
180	4	6	3	2	1.1	1					
185	1	6	3	4	1.1	1					
185	2	6	3	4	1.1	1					
185	3	6	3	2	1.1	1	3				
185	4	6	3	4	1.1	1					
190	1	6	3	9	1.1	0.67					
190	2	6	3	1	1.1	0.67					
190	3	6	3	5	1.1	0.67					
190	4	6	3	4	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
					Minimum	Fans	Fan	Fan	Exhaust	Controls
100	FSHOFFIC	FSHOFFIC								
105	FSHMUSP	FSHMUSL								
110	FSHOFFIC	FSHOFFIC								
115	FSHOFFIC	FSHOFFIC								
125	FSHOFFIC	FSHOFFIC								
130	FSHOFFIC	FSHOFFIC								
135	FSHOFFIC	FSHOFFIC								
140	FSHOFFIC	FSHOFFIC								
145	FSHOFFIC	FSHOFFIC								
150	AVAIL	AVAIL								
155	FSHOFFIC	FSHOFFIC								
160	FSHCLASP	FSHCLASL								
165	FSHOFFIC	FSHOFFIC								
170	FSHOFFIC	FSHOFFIC								
175	FSHOFFIC	FSHOFFIC								
180	FSHOFFIC	FSHOFFIC								
185	FSHOFFIC	FSHOFFIC								
190	FSHOFFIC	FSHOFFIC								

## Card 27----- People and Lights -----

Room Number	People				Lighting				Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
	Value	Units	Sensible	Latent	Value	Units	Fixture Type				Reference Point 1	Reference Point 2
100	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2					
105	25	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2					
110	48	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
115	48	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
125	17	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
130	4	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2					
135	15	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2					
140	15	PEOPLE	250	200	0.6	WATT-SF	ASHRAE2					
145	1	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2					
150	2	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					
155	8	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
160	40	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
165	15	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
170	12	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
175	5	PEOPLE	250	200	1.25	WATT-SF	ASHRAE2					
180	6	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					
185	6	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					
190	25	PEOPLE	250	200	1.25	WATT-SF	ASHRAE2					

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump		Energy Consump		Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Number	Descrip	Value	Units	Schedule Code							
100	1	COMPUTERS	1	WATT-SF	FSHOFFIC	NONE						
105	1	MUSEUM EQ.	1.2	WATT-SF	FSHMUSL	NONE						
110	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE						
115	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE						
125	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE						
130	1	OFFICE EQ.	0.3	WATT-SF	FSHOFFIC	NONE						
135	1	OFFICE EQ.	0.3	WATT-SF	FSHOFFIC	NONE						
140	1	OFFICE EQ.	0.8	WATT-SF	FSHOFFIC	NONE						
145	1	OFFICE EQ.	1.0	WATT-SF	FSHOFFIC	NONE						
150	1	OFFICE EQ.	1.0	WATT-SF	AVAIL	NONE						
155	1	OFFICE EQ.	1.7	WATT-SF	FSHOFFIC	NONE						
160	1	CLASS EQ.	0.5	WATT-SF	FSHCLASL	NONE						
165	1	OFFICE EQ.	1.8	WATT-SF	FSHOFFIC	NONE						
170	1	OFFICE EQ.	1.0	WATT-SF	FSHOFFIC	NONE						
175	1	OFFICE EQ.	2.3	WATT-SF	FSHOFFIC	NONE						
180	1	OFFICE EQ.	2.7	WATT-SF	FSHOFFIC	NONE						
185	1	OFFICE EQ.	2.8	WATT-SF	FSHOFFIC	NONE						
190	1	OFFICE EQ.	1.5	WATT-SF	FSHOFFIC	NONE						

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		Value	Units
100	20	CFM-P	20	CFM-P						

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	----Cooling----		----Heating----		----Cooling----		----Heating----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
110	20	CFM-P	20	CFM-P						
115	20	CFM-P	20	CFM-P						
125	20	CFM-P	20	CFM-P						
130	20	CFM-P	20	CFM-P						
135	20	CFM-P	20	CFM-P						
140	20	CFM-P	20	CFM-P						
145	20	CFM-P	20	CFM-P						
150	20	CFM-P	20	CFM-P						
155	20	CFM-P	20	CFM-P						
160	15	CFM-P	15	CFM-P						
165	20	CFM-P	20	CFM-P						
170	20	CFM-P	20	CFM-P						
175	20	CFM-P	20	CFM-P						
180	20	CFM-P	20	CFM-P						
185	20	CFM-P	20	CFM-P						
190	990	CFM	990	CFM						

Card 31----- Partition Parameters -----										
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No	
160	1	48	13	0.14	64	HRLYOADB				
165	1	70	13	0.32	64	HRLYOADB				
170	1	70	13	0.32	64	HRLYOADB				

Card 33----- External Shading -----										
-----OVERHANG-----					-----VERTICAL FINS-----					
Shading	Glass	Above	Projection	Glass	Projection	Left	Projection	Right	Projection	Adjacent
Type	Height	Glass	Out	Width	Left	Out	Right	Out	Flag	Building
3	5	2	8							

----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING AIRSIDE EQUIPMENT

## Card 40----- System Type -----

```

-----OPTIONAL VENTILATION SYSTEM-----
System      Ventil      Fan
Set   System Deck   Cooling Heating Cooling Heating Static
Number Type   Location SADBvh SADBvh Schedule Schedule Pressure
1     SZ
2     COMP
3     SZ
4     MZ
5     FC
6     PTAC
7     PTAC
8     PTAC
9     PTAC
10    SZ
11    PTAC
12    PTAC
13    PTAC
14    PTAC
15    FC
16    FC
17    MZ

```

## Card 41----- Zone Assignment -----

```

System
Set      Ref #1      Ref #2      Ref #3      Ref #4      Ref #5      Ref #6
Number   Begin   End   Begin   End   Begin   End   Begin   End   Begin   End   Begin   End
1         100    100
2         105    105
3         110    110
4         115    115
5         125    125
6         130    130
7         135    135
8         140    140
9         145    145
10        150    150
11        155    160
12        165    165
13        170    170
14        175    175
15        180    180
16        185    185
17        190    190

```

## Card 42----- Fan SP and Duct Parameters-----

```

System Cool Heat Return Mn Exh Aux Rm Exh Cool Return Supply Supply Return
Set   Fan  Fan  Fan   Fan   Fan  Fan   Fan Mtr Fan Mtr Duct  Duct  Air
Number SP   SP   SP    SP    SP   SP    Loc    Loc    Ht Gn  Loc   Path
1      1.0  1.0
2      1

```

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
3	1										
4	1										
5	1										
6	1										
7	1										
8	1										
9	1										
10	1										
11	1										
12	1										
13	1										
14	1										
15	1										
16	1										
17	2										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	OFF					OFF	OFF	OFF		
2						FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8						FTSAMHTG	FTSAMHTG	FTSAMHTG		
9						FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11						FTSAMHTG	FTSAMHTG	FTSAMHTG		
12						FTSAMHTG	FTSAMHTG	FTSAMHTG		
13						FTSAMHTG	FTSAMHTG	FTSAMHTG		
15	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
16	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
17						FTSAMHTG	FTSAMHTG	FTSAMHTG		

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

	Elec Consump	Elec Demand	Demand		----- Demand Limit ---
Alternative	Time of Day	Time of Day	Limit		Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule Drift
1				EXISTING WATERSIDE EQUIPMENT	





## Card 63----- Cooling Pumps and References -----

Ref	Full Load Value	Full Load Units	Full Load Value	Full Load Units	Full Load Value	Full Load Units	Full Load Value	Full Load Units	over Control	Cold Storage	Cooling Tower	Misc. Access.
2			2.2	KW							1	2
3	1.49	KW										
4	2.24	KW										
6	2.38	KW										
13	0.56	KW										
17	0.37	KW										1
18	0.56	KW										

## Card 65----- Heating Load Assignment -----

Load Assignment Reference	All Coil Heating Ref	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1 1								
2	2	2 2								
3	3	3 3								
4	4	4 4								
5	5	5 5								
6	6	6 6								
7	7	7 7								
8	8	8 8								
9	9	9 9								
10	10	10 10								
11	11	11 11								
12	12	12 12								
13	13	13 13								
14	14	14 14								
15	15	15 16								
16	16	17 17								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot Strg	Misc. Acc.	Demand Limit
Number	Name	Units	Value Units	Value Units	Value Units	Number	Control		Cogen	Number
1	BOILERWT	1	.37 KW	327 MBH	450 MBH					
2	EQ2201	1		140 MBH	195.4 MBH					
3	BOILERWT	1	0.75 KW	587 MBH	810 MBH					
4	BOILERWT	1	0.56 KW	201 MBH	250 MBH				3	
5	BOILERWT	1	2.38 KW	108.8 MBH	154.7 MBH					
6	EQ2263	1		4.4 KW	100 PCTEFF					
7	EQ2263	1		8.9 KW	100 PCTEFF					
8	BOILERWT	1	0.19 KW	125.1 MBH	174.4 MBH					





## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
6	EQ5020	0.37	KW									
7	EQ5020	0.56	KW									
8	EQ5020	0.37	KW									
9	HUMIDIF	6.0	KW		FSHMUSP							

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO A-INSTALL EMS FOR HVAC EQUIPMENT

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	5	BLDG 122	113	113	3	3	2.54	11			
6	6	BLDG 140	50	26	3	5	2.54	15			
10	10	BLDG 124	113	113	3	3	2.54	11			
15	15	BLDG 128	119	119	3	8	2.54	18			
20	20	BLDG 133	100	96	3	8	2.54	18			
25	25	BLDG 134	102	102	3	3	2.54	12			
30	30	BLDG 143	122	122	3	3	2.54	12			
35	35	BLDG 144	122	122	3	3	2.54	12			
40	40	BLDG 145	122	122	3	3	2.54	12			
45	45	BLDG 146	122	122	3	3	2.54	12			
50	50	BLDG 147	122	122	3	3	2.54	12			
55	55	BLDG 149	122	122	3	3	2.54	12			
60	60	BLDG 197	122	122	3	3	2.54	12			
65	65	BLDG 198	68	68	3	5	2.54	14			
70	70	BLDG 199	80	80	3	2	2.54	12			
75	75	BLDG 125	50	26	3	5	2.54	15			
80	80	BLDG 127	50	26	3	5	2.54	15			
85	85	BLDG 135	50	26	3	5	2.54	15			
90	90	BLDG 250-1	142	34	3	2	2.54	10.5			
95	95	BLDG 250-2	195	195	3	2	2.54	10.5			

## Card 21----- Thermostat Parameters -----

Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design	DB	DRH	Driftpoint	Schedule	Design	DB	Driftpoint	Schedule	Flag
5	78	50	78		70	70		ROOM	LIGHT30	NO

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
6	78	50	78		70	70		ROOM	LIGHT30	YES
10	78	50	78		70	70		ROOM	LIGHT30	NO
15	78	50	78		70	70		ROOM	LIGHT30	NO
20	78	50	78		70	70		ROOM	LIGHT30	NO
25	78	50	78		70	70		ROOM	LIGHT30	NO
30	78	50	78		70	70		ROOM	LIGHT30	NO
35	78	50	78		70	70		ROOM	LIGHT30	NO
40	78	50	85		70	65		ROOM	LIGHT30	NO
45	78	50	78		70	70		ROOM	LIGHT30	NO
50	78	50	78		70	70		ROOM	LIGHT30	NO
55	78	50	78		70	70		ROOM	LIGHT30	NO
60	78	50	78		70	70		ROOM	LIGHT30	NO
65	78	50	78		70	70		ROOM	LIGHT30	NO
70	78	50	78		70	70		ROOM	LIGHT30	NO
75	78	50	85		70	65		ROOM	LIGHT30	NO
80	78	50	78		70	70		ROOM	LIGHT30	NO
85	78	50	78		70	70		ROOM	LIGHT30	NO
90	78	50	78		70	70		ROOM	LIGHT30	NO
95	78	50	78		70	70		ROOM	LIGHT30	NO

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	180	30	.08	37	0	60	
6	1	YES			0.08	40		60	
10	1	NO	180	30	.08	37	0	60	
15	1	YES			.08	37	0	60	
20	1	YES			.08	37	0	60	
25	1	NO	73	74	.05	40	0	45	
30	1	NO	146	28	.05	40	0	80	
35	1	NO	146	28	.05	40	0	80	
40	1	NO	146	28	.05	40	0	80	
45	1	NO	146	28	.05	40	0	80	
50	1	NO	146	28	.05	40	0	80	
55	1	NO	146	28	.05	40	0	80	
60	1	NO	146	28	.05	40	0	80	
65	1	NO	39	39	.08	37	0	60	
70	1	NO	56	57	.05	37	0	60	
75	1	YES			.08	37	0	60	
80	1	YES			.08	37	0	60	
85	1	YES			.08	37	0	60	
90	1	YES			.06	23	0	90	
95	1	NO	113	113	.06	23	0	90	

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc	Wall
					Type	Direction
						Tilt
						Alpha
						Multiplier
5	1	360	11	.17	58	330
5	2	60	11	.17	58	60
5	3	360	11	.17	58	150
5	4	60	11	.17	58	240
6	1	50	15	0.17	64	315
6	2	26	15	0.17	64	45
6	3	50	15	0.17	64	135
6	4	26	15	0.17	64	225
10	1	360	11	.17	58	315
10	2	60	11	.17	58	45
10	3	360	11	.17	58	135
10	4	60	11	.17	58	225
15	1	100	18	.10	58	315
15	2	96	18	.10	58	45
15	3	100	18	.10	52	135
15	4	96	18	.10	58	225
20	1	100	18	.10	58	330
20	2	96	18	.10	58	60
20	3	100	18	.10	52	150
20	4	96	18	.10	58	240
25	1	280	12	.11	88	315
25	2	60	12	.11	88	45
25	3	280	12	.11	88	135
25	4	60	12	.11	88	225
30	1	292	12	.10	58	0
30	2	56	12	.10	58	90
30	3	292	12	.10	58	180
30	4	56	12	.10	58	270
35	1	292	12	.10	58	0
35	2	56	12	.10	58	90
35	3	292	12	.10	58	180
35	4	56	12	.10	58	270
40	1	292	12	.10	58	0
40	2	56	12	.10	58	90
40	3	292	12	.10	58	180
40	4	56	12	.10	58	270
45	1	292	12	.10	58	0
45	2	56	12	.10	58	90
45	3	292	12	.10	58	180
45	4	56	12	.10	58	270
50	1	292	12	.10	58	90
50	2	56	12	.10	58	180
50	3	292	12	.10	58	270
50	4	56	12	.10	58	0
55	1	292	12	.10	58	90
55	2	56	12	.10	58	180
55	3	292	12	.10	58	270

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground	
					Constuc	Type				Reflectance	Multiplier
55	4	56	12	.10	58		0				
60	1	292	12	.10	58		320				
60	2	56	12	.10	58		50				
60	3	292	12	.10	58		140				
60	4	56	12	.10	58		230				
65	1	27.5	14	.12	74		0				
65	2	59	14	.12	74		90				
65	3	27.5	14	.12	74		180				
65	4	59	14	.12	74		270				
70	1	126	12	.12	74		315				
70	2	31	12	.12	74		45				
70	3	126	12	.12	74		135				
70	4	31	12	.12	74		225				
75	1	50	15	.17	58		315				
75	2	26	15	.17	58		45				
75	3	50	15	.17	58		135				
75	4	26	15	.17	58		225				
80	1	50	15	.17	58		315				
80	2	26	15	.17	58		45				
80	3	50	15	.17	58		135				
80	4	26	15	.17	58		225				
85	1	50	15	.17	58		315				
85	2	26	15	.17	58		45				
85	3	50	15	.17	58		135				
85	4	26	15	.17	58		225				
90	1	142	10.5	.12	74		0				
90	2	58	10.5	.12	74		90				
90	3	52	10.5	.12	74		180				
90	4	58	10.5	.12	74		270				
95	1	20	10.5	.12	74		0				
95	2	798	10.5	.12	74		90				
95	3	60	10.5	.12	74		180				
95	4	798	10.5	.12	74		270				

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
5	1	5	3	34	1.1	.67					
5	2	5	3	6	1.1	.67					
5	3	5	3	34	1.1	.67	3				
5	4	5	3	6	1.1	.67					
6	1	8	3	4	0.73	0.67					
6	2	8	3	4	0.73	0.67					
6	3	8	3	4	0.73	0.67					

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
6	4	8	3	2	0.73	0.67					
10	1	5	3	34	1.1	.67					
10	2	5	3	6	1.1	.67					
10	3	5	3	34	1.1	.67	3				
10	4	5	3	6	1.1	.67					
15	1	7	3	8	1.1	.67	3				
15	2	7	3	7	1.1	.67					
15	3	7	3	9	1.1	.67					
15	4	7	3	7	1.1	.67					
20	1	7	3	8	1.1	.67	3				
20	2	7	3	7	1.1	.67					
20	3	7	3	9	1.1	.67					
20	4	7	3	7	1.1	.67					
25	1	6	3	26	.8	.67					
25	2	6	3	5	.8	.67					
25	3			29	.53	1					
25	4	6	3	5	.8	.67					
30	1	7	3.5	21	1.1	.67	3				
30	2	7	3.5	6	1.1	.67					
30	3			35	1.1	.67	3				
30	4	7	3.5	6	1.1	.67					
35	1	7	3.5	21	1.1	.67	3				
35	2	7	3.5	6	1.1	.67					
35	3			35	1.1	.67	3				
35	4	7	3.5	6	1.1	.67					
40	1	7	3.5	21	1.1	.67	3				
40	2	7	3.5	6	1.1	.67					
40	3			35	1.1	.67	3				
40	4	7	3.5	6	1.1	.67					
45	1	7	3.5	21	1.1	.67	3				
45	2	7	3.5	6	1.1	.67					
45	3			35	1.1	.67	3				
45	4	7	3.5	6	1.1	.67					
50	1	7	3.5	21	1.1	.67	3				
50	2	7	3.5	6	1.1	.67					
50	3			35	1.1	.67	3				
50	4	7	3.5	6	1.1	.67					
55	1	7	3.5	21	1.1	.67	3				
55	2	7	3.5	6	1.1	.67					
55	3			35	1.1	.67	3				
55	4	7	3.5	6	1.1	.67					
60	1	7	3.5	21	1.1	.67	3				
60	2	7	3.5	6	1.1	.67					
60	3			35	1.1	.67	3				
60	4	7	3.5	6	1.1	.67					
65	1	5	3	6	1.1	.67					
65	2	5	3	11	1.1	.67	3				



## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External		Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
				or No. of Windows	Glass U-Value		Shading Type	Shading Type				
65	3	5	3	6	1.1	.67						
65	4	5	3	11	1.1	.67	3					
70	1	5	3	10	1.1	.67	3					
70	2	5	3	2	1.1	.67						
70	3	5	3	10	1.1	.67						
70	4	5	3	2	1.1	.67						
75	1	8	3	4	.73	.67						
75	2	8	3	2	.73	.67						
75	3	8	3	4	.73	.67						
75	4	8	3	2	.73	.67						
80	1	8	3	4	.73	.67						
80	2	8	3	2	.73	.67						
80	3	8	3	4	.73	.67						
80	4	8	3	2	.73	.67						
85	1	8	3	4	.73	.67						
85	2	8	3	2	.73	.67						
85	3	8	3	4	.73	.67						
85	4	8	3	2	.73	.67						
90	1	4	2	3	1.1	1						
90	3	7	5	3	1.1	1						
90	4	7	5	3	1.1	1						
95	2	4	2	114	1.1	.67						
95	3	4	2	6	1.1	.67						
95	4	4	2	114	1.1	.67						

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
					Minimum	Fans	Fan	Fan	Exhaust	Controls
5	FSHOFFIC	FSHOFFIC				DAYSCHED				
6	FSHOFFIC	FSHOFFIC				DAYSCHED				
10	FSHOFFIC	FSHOFFIC				DAYSCHED				
15	FSHOFFIC	FSHOFFIC				DAYSCHED				
20	FSHOFFIC	FSHOFFIC				DAYSCHED				
25	FSHOFFIC	FSHOFFIC				DAYSCHED				
30	FSHOFFIC	FSHOFFIC				DAYSCHED				
35	FSHOFFIC	FSHOFFIC				DAYSCHED				
40	FSHOFFIC	FSHOFFIC								
45	FSHOFFIC	FSHOFFIC				DAYSCHED				
50	FSHBARRP	FSHBARRL				BARRSCHD				
55	FSHBARRP	FSHBARRL				BARRSCHD				
60	FSHOFFIC	FSHOFFIC				DAYSCHED				
65	FSHOFFIC	FSHOFFIC				DAYSCHED				
70	FSHOFFIC	FSHOFFIC				DAYSCHED				
75	FSHOFFIC	FSHOFFIC								
80	FSHOFFIC	FSHOFFIC				DAYSCHED				

Card 26----- Schedules -----

Room	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
85	FSHOFFIC	FSHOFFIC				DAYSCHED				
90	FSHOFFIC	FSHOFFIC				DAYSCHED				
95	FSHBARRP	FSHBARRL				BARRSCHD				

Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
5	60	PEOPLE	250	200	2	WATT-SF	ASHRAE2				
6	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2				
10	60	PEOPLE	250	200	2	WATT-SF	ASHRAE2				
15	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
20	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
25	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
30	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
35	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
40	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
45	175	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
50	45	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
55	45	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
60	250	SF-PERS	250	200	2.25	WATT-SF	ASHRAE2				
65	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
70	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2				
75	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2				
80	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2				
85	6	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2				
90	160	SF-PERS	250	200	2	WATT-SF	INCAND				
95	160	SF-PERS	250	200	1.5	WATT-SF	INCAND				

Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
6	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE					
10	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
15	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
20	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
30	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
40	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
45	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
50	1	T.V.-ETC.	1	WATT-SF	FSHBARRL	NONE					

Card 28----- Miscellaneous Equipment -----											
Room	Misc		Energy	Energy		Energy	Percent	Percent	Percent		
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
55	1	T.V.-ETC.	1	WATT-SF	FSHBARRL	NONE					
60	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
65	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
70	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
75	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
80	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
85	1	COMPUTER	2	WATT-SF	FSHOFFIC	NONE					
90	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
95	1	COMPUTER	1	WATT-SF	FSHBARRL	NONE					

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
6	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	20	CFM-P	20	CFM-P						
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	15	CFM-P	15	CFM-P						
55	15	CFM-P	15	CFM-P						
60	20	CFM-P	20	CFM-P						
65	20	CFM-P	20	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	20	CFM-P	20	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						
95	20	CFM-P	20	CFM-P						

Card 32----- Exposed Floor Parameters -----											
Exposed -----Slab-----				-----Exposed Floor-----							
Room	Floor	Perimeter	Loss	Floor	Floor	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Coefficient	Area	U-Value	Type	Flag	Temp	Temp	Room No	
5	1			5400	.19	119	HRLYOADB				
10	1			5400	.19	119	HRLYOADB				
15	1			14224	.19	119	HRLYOADB				
20	1			9600	.19	119	HRLYOADB				

Card 32----- Exposed Floor Parameters-----

Room Number	Exposed Slab-----			Exposed Floor-----						
	Floor Number	Perimeter Length	Loss Coefficient	Floor Area	Floor U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
50	1			5400	.19	119	HRLYOADB			
55	1			5400	.19	119	HRLYOADB			
70	1			3906	.25	119	HRLYOADB			

Card 33----- External Shading -----

Shading Type	Glass Height	OVERHANG-----		VERTICAL FINS-----						Adjacent Building Flag
		Above Glass	Projection Out	Glass Width	Projection Left	Left Out	Projection Right	Right Out		
3	5	2	8							

----- System Section Alternative #2 -----

Card 39- System Alternative

Number	Description
2	ECO A-INSTALL EMS AIRSIDE SYS.

Card 40----- System Type -----

System Set Number	System Type	OPTIONAL VENTILATION SYSTEM-----					
		Ventil Deck Location	Cooling SADEVh	Heating SADEVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	MZ						
2	SZ						
3	MZ						
4	MZ						
5	MZ						
6	MZ						
7	MZ						
8	MZ						
9	PTAC						
10	SZ						
11	MZ						
12	MZ						
13	SZ						
14	SZ						
15	MZ						
16	FC						
17	SZ						
18	SZ						



## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
11	1.4										
12	1.4										
13	1.4										
14	1.5										
15	1.5										
16	1										
17	1										
18	1										
19	2.5										
20	2.5										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	OFF					OFF	OFF	OFF		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
6	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
12	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
13	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
14	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
15	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
16	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
17	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
18	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
19	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
20	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1			OPSTART	OPSTOP					
2			OPSTART	OPSTOP					
3			OPSTART	OPSTOP					







## Card 64----- Cooling Equipment Options -----

Cool Ref	Max CW	Load Shed	Free Evap Precool	Free Cooling Type	Heat Source	Cond Entering Temp	Cond Min Oper Temp	Cond Rej To Ref Type	Cond Rej To Ref Number	Cond Rej @ HW Temp
1	10									
2	10									
3	10									
4	10									
5	10									
6	10									
8	10									
10	10									
11	10									
12	10									
14	10									
16	10									

## Card 65----- Heating Load Assignment -----

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1 2								
2	2	3 3								
3	3	4 4								
4	4	5 5								
5	5	6 6	18 18							
6	6	7 7								
7	7	8 8								
8	8	9 9								
9	9	10 10								
10	10	11 11								
11	11	12 12								
12	12	13 13								
13	13	14 14								
14	14	15 15								
15	15	17 17								
16	16	19 20								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot Strg	Misc. Acc.	Cogen	Demand Limit			
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILERWT	1	1.12	KW	618	MBH	850	MBH				2		
2	BOILERWT	1	1.12	KW	618	MBH	850	MBH				4		
3	BOILERWT	1	0.37	KW	109	MBH	150	MBH						
4	BOILERWT	1	.37	KW	109	MBH	150	MBH				1		
5	BOILERWT	1	.37	KW	596	MBH	820	MBH						
6	BOILERWT	1	.75	KW	596	MBH	820	MBH						
7	BOILERWT	1	.75	KW	596	MBH	820	MBH						



## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY---					
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
5	7.5											
6	8.2											
11	7.5											
12	7.5											
13	6.7											
17	2.2											
19	5.6											
20	34.0											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP HT LOS	1.27	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE HT LOS	7.35	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP HT LOS	1.32	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE HT LOSS	7.36	MBH	FTSAMHTG	HOT-LD	2			
5	PIPE-PUMP HT LOS	0.0	TONS	FTSAMCLG	CHILL-LD	3			
6	PIPE HT LOSS	0.0	MBH	FTSAMHTG	HOT-LD	3			
7	PIPE-PUMP HT LOS	.83	TONS	FTSAMCLG	CHILL-LD	4			
8	PIPE HT LOSS	6.05	MBH	FTSAMHTG	HOT-LD	4			
9	PIPE-PUMP HT LOS	0.89	TONS	FTSAMCLG	CHILL-LD	5			
10	PIPE HT LOSS	4.5	MBH	FTSAMHTG	HOT-LD	5			
11	PIPE-PUMP HT LOS	1.3	TONS	FTSAMCLG	CHILL-LD	6			
12	PIPE HT LOS	6.1	MBH	FTSAMHTG	HOT-LD	6			
13	PIPE-PUMP HT LOS	1.3	TONS	FTSAMCLG	CHILL-LD	8			
14	PIPE HT LOSS	6.1	MBH	FTSAMHTG	HOT-LD	7			
15	COMPR HEAT	1.39	TONS	FTSAMCLG	CHILL-LD	9			
16	REFRIG. HT LOSS	7.1	MBH	FTSAMHTG	HOT-LD	8			
17	PIPE-PUMP HT LOS	0.98	TONS	FTSAMCLG	CHILL-LD	10			
18	PIPE HT LOSS	6.1	MBH	FTSAMHTG	HOT-LD	9			
19	PIPE-PUMP HT LOS	1.98	TONS	FTSAMCLG	CHILL-LD	11			
20	PIPE HT LOSS	5.0	MBH	FTSAMHTG	HOT-LD	10			
21	PIPE HT LOSS	5.0	MBH	FTSAMHTG	HOT-LD	11			
22	PIPE-PUMP HT LOS	1.04	TONS	FTSAMCLG	CHILL-LD	12			
23	PIPE HT LOSS	5.45	MBH	FTSAMHTG	HOT-LD	12			
24	PIPE-PUMP HT LOS	.53	TONS	FTSAMCLG	CHILL-LD	13			
25	PIPE HT LOSS	1.95	MBH	FTSAMHTG	HOT-LD	13			
26	PIPE-PUMP HT LOS	0.72	TONS	FTSAMCLG	CHILL-LD	14			
27	PIPE HT LOSS	3.55	MBH	FTSAMHTG	HOT-LD	14			
28	PIPE HT LOSS	.11	TONS	FTSAMCLG	CHILL-LD	15			
29	PIPE HT LOSS	0.85	MBH	FTSAMHTG	HOT-LD	15			
30	PIPE-PUMP HT LOS	3	TONS	FTSAMCLG	CHILL-LD	16			
31	PIPE HT LOSS	12.32	MBH	FTSAMHTG	HOT-LD	16			



## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
2	HUMIDIF	6.0	KW	FSHMUSP								
3	EQ5020	0.56	KW	FTSAMHTG								
4	EQ5020	0.37	KW	FTSAMHTG								

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO A-INSTALL EMS FOR HVAC EQUIPMENT

## Card 20----- General Room Parameters -----

Zone		Acoustic							Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth	
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone		
100	100	BLDG. 142	65	65	3	2	2.54	10				
105	105	BLDG. 123	72	72	3	10	2.54	24				
110	110	BLDG. 126	94.5	94.5	3	2	2.54	12				
115	115	BLDG. 131	94.5	94.5	3	2	2.54	12				
125	125	BLDG. 129	97	97	3	3	2.54	12				
130	130	BLDG. 151	40	40.5	3	1	2.54	11				
135	135	BLDG. 154	40	40.5	3	1	2.54	11				
140	140	BLDG. 156	40	40.5	3	1	2.54	11				
145	145	BLDG. 157	40	40.5	3	1	2.54	11				
150	150	BLDG. 159	40	40.5	3	1	2.54	11				
155	155	BLDG. 152 ADMIN	44.5	44.5	3	2.5	2.54	15				
160	160	BLDG. 152 CLASS	46	46	3	2.5	2.54	15				
165	165	BLDG. 155	90.5	91	3	2.5	2.54	15				
170	170	BLDG. 158	64	64	3	2.5	2.54	15				
175	175	BLDG. 141	31.2	32	3	2	2.54	12				
180	180	BLDG. 260	41.5	42	3	2	2.54	12				
185	185	BLDG. 261	39.5	39.5	3	2	2.54	12				
190	190	BLDG. 268	92	92	3	3	2.54	12				

## Card 21----- Thermostat Parameters -----

Cooling		Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
Number	Design	DB	RH	Driftpoint	Design	DB	Driftpoint	Schedule	Flag	Average	Floor
100	78	50	78		70	70		ROOM	LIGHT30	YES	
105	78	50	78		70	70		ROOM	LIGHT30	YES	

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
110	78	50	78		70	70		ROOM	LIGHT30	YES
115	78	50	78		70	70		ROOM	LIGHT30	YES
125	78	50	78		70	70		ROOM	LIGHT30	YES
130	78	50	85		70	65		ROOM	LIGHT30	YES
135	78	50	85		70	65		ROOM	LIGHT30	YES
140	78	50	85		70	65		ROOM	LIGHT30	YES
145	78	50	85		70	65		ROOM	LIGHT30	YES
150	78	50	85		70	65		ROOM	LIGHT30	YES
155	78	50	85		70	65		ROOM	LIGHT30	YES
160	78	50	85		70	65		ROOM	LIGHT30	YES
165	78	50	78		70	70		ROOM	LIGHT30	YES
170	78	50	85		70	65		ROOM	LIGHT30	YES
175	78	50	85		70	65		ROOM	LIGHT30	YES
180	78	50	85		70	65		ROOM	LIGHT30	YES
185	78	50	85		70	65		ROOM	LIGHT30	YES
190	78	50	78		70	70		ROOM	LIGHT30	YES

## Card 22----- Roof Parameters -----

Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
100	1	NO	47	33	0.05	40	0	80	
105	1	YES			0.05	40		75	
110	1	YES			0.08	40		75	
115	1	YES			0.08	40		75	
125	1	NO	69	69	0.05	40		45	
130	1	YES			0.08	40		60	
135	1	YES			0.08	40		60	
140	1	YES			0.08	40		60	
145	1	YES			0.08	40		60	
150	1	YES			0.08	40		60	
155	1	YES			0.08	40		60	
160	1	YES			0.08	40		60	
165	1	NO	64	64	0.08	40		60	
170	1	YES			0.08	40		60	
175	1	NO	22.5	22.5	0.08	40		45	
180	1	YES			0.08	40		60	
185	1	YES			0.08	40		60	
190	1	YES			0.08	40		65	

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Const	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance Multiplier
100	1	118	10	.16	64	0			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc	Type	Direction	Tilt	Alpha
									Reflectance
									Multiplier
100	2	83	10	.16	64		90		
100	3	118	10	.16	64		180		
100	4	83	10	.16	64		270		
105	1	115	14	.014	64		0		
105	2	135	14	0.14	64		90		
105	3	115	14	0.14	64		180		
105	4	134	14	0.14	64		270		
110	1	292	12	0.14	64		225		
110	2	60	12	0.14	64		315		
110	3	292	12	0.14	64		45		
110	4	60	12	0.14	64		135		
115	1	292	12	0.14	64		225		
115	2	60	12	0.14	64		315		
115	3	292	12	0.14	64		45		
115	4	60	12	0.14	64		135		
125	1	308	12	0.11	64		0		
125	2	77	12	0.11	64		90		
125	3	308	12	0.11	64		180		
125	4	77	12	0.11	64		270		
130	1	41	12	0.14	64		0		
130	2	39	12	0.14	64		90		
130	3	42	12	0.14	64		180		
130	4	39	12	0.14	64		270		
135	1	41	12	0.14	64		0		
135	2	39	12	0.14	64		90		
135	3	42	12	0.14	64		180		
135	4	39	12	0.14	64		270		
140	1	41	12	0.14	64		0		
140	2	39	12	0.14	64		90		
140	3	42	12	0.14	64		180		
140	4	39	12	0.14	64		270		
145	1	39	12	0.14	64		0		
145	2	42	12	0.14	64		90		
145	3	39	12	0.14	64		180		
145	4	42	12	0.14	64		270		
150	1	39	12	0.14	64		0		
150	2	42	12	0.14	64		90		
150	3	39	12	0.14	64		180		
150	4	42	12	0.14	64		270		
155	1	70	13	0.14	64		0		
155	2	70	13	0.14	64		180		
160	1	40	13	0.14	64		0		
160	2	53	13	0.14	64		90		
160	3	40	13	0.14	64		180		
160	4	53	13	0.14	64		270		

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
165	1	110	13	0.14	64	0			
165	2	53	13	0.14	64	90			
165	3	40	13	0.14	64	180			
165	4	53	13	0.14	64	270			
170	1	53	13	0.14	64	0			
170	2	110	13	0.14	64	90			
170	3	53	13	0.14	64	180			
170	4	40	13	0.14	64	270			
175	1	36	12	0.14	64	0			
175	2	56	12	0.14	64	90			
175	3	36	12	0.14	64	180			
175	4	56	12	0.14	64	270			
180	1	33	12	0.14	64	0			
180	2	53.5	12	0.14	64	90			
180	3	33	12	0.14	64	180			
180	4	53.5	12	0.14	64	270			
185	1	35	12	0.14	64	0			
185	2	44	12	0.14	64	90			
185	3	35	12	0.14	64	180			
185	4	44	12	0.14	64	270			
190	1	136	12	0.14	64	0			
190	2	71	12	0.14	64	90			
190	3	136	12	0.14	64	180			
190	4	71	12	0.14	64	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
100	1	5	3.5	5	1.1	0.67					
100	2	5	3.5	6	1.1	0.67					
100	3	5	3.5	7	1.1	0.67					
100	4	5	3.5	6	1.1	0.67					
105	1	3	7.5	10	1.1	0.67		3			
105	2	3	7.5	11	1.1	0.67					
105	3	3	7.5	9	1.1	0.67					
105	4	3	7.5	11	1.1	0.67					
110	1	8	4	25	1.1	0.67					
110	2	8	4	4	1.1	0.67					
110	3	8	4	22	1.1	0.67		3			
110	4	8	4	4	1.1	0.67					
115	1	8	4	25	1.1	0.67					
115	2	8	4	4	1.1	0.67					
115	3	8	4	22	1.1	0.67		3			
115	4	8	4	4	1.1	0.67					



## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
125	1	8	4	25	1.1	1					
125	2	8	4	4	1.1	1					
125	3	8	4	22	1.1	1					
125	4	8	4	4	1.1	1					
130	1	4	2	4	1.1	0.67					
130	2	4	2	4	1.1	0.67					
130	3	4	2	5	1.1	0.67					
130	4	4	2	3	1.1	0.67					
135	1	4	2	4	1.1	0.67					
135	2	4	2	4	1.1	0.67					
135	3	4	2	5	1.1	0.67					
135	4	4	2	3	1.1	0.67					
140	1	4	2	4	1.1	0.67					
140	2	4	2	4	1.1	0.67					
140	3	4	2	5	1.1	0.67					
140	4	4	2	3	1.1	0.67					
145	1	4	2	3	1.1	0.67					
145	2	4	2	4	1.1	0.67					
145	3	4	2	3	1.1	0.67					
145	4	4	2	5	1.1	0.67					
150	1	4	2	3	1.1	0.67					
150	2	4	2	4	1.1	0.67					
150	3	4	2	3	1.1	0.67					
150	4	4	2	5	1.1	0.67					
155	1	6	3	6	1.1	1		3			
155	2	6	3	6	1.1	1		3			
160	1	6	3	6	1.1	1		3			
160	2	6	3	4	1.1	1					
160	3	6	3	4	1.1	1					
160	4	6	3	5	1.1	1					
165	1	8	3	10	1.1	1		3			
165	2	8	3	5	1.1	1					
165	3	8	3	4	1.1	1					
165	4	8	3	5	1.1	1					
170	1	8	3	5	1.1	1					
170	2	8	3	10	1.1	0.67		3			
170	3	8	3	5	1.1	0.67					
170	4	8	3	4	1.1	0.67					
175	1	8	2	3	1.1	0.67					
175	2	8	2	6	1.1	0.67					
175	3	8	2	2	1.1	0.67					
175	4	8	2	6	1.1	0.67					
180	1	6	3	4	1.1	1					
180	2	6	3	2	1.1	1					
180	3	6	3	2	1.1	1		3			
180	4	6	3	2	1.1	1					
185	1	6	3	4	1.1	1					

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading		Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value		Type	Type		Solar to Ret. Air	Visible Transmittance	
185	2	6	3	4	1.1	1						
185	3	6	3	2	1.1	1	3					
185	4	6	3	4	1.1	1						
190	1	6	3	9	1.1	0.67						
190	2	6	3	1	1.1	0.67						
190	3	6	3	5	1.1	0.67						
190	4	6	3	4	1.1	0.67						

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
100	FSHOFFIC	FSHOFFIC				DAYSCHED				
105	FSHMUSP	FSHMUSL								
110	FSHOFFIC	FSHOFFIC				DAYSCHED				
115	FSHOFFIC	FSHOFFIC				DAYSCHED				
125	FSHOFFIC	FSHOFFIC				DAYSCHED				
130	FSHOFFIC	FSHOFFIC								
135	FSHOFFIC	FSHOFFIC								
140	FSHOFFIC	FSHOFFIC								
145	FSHOFFIC	FSHOFFIC								
150	AVAIL	AVAIL								
155	FSHOFFIC	FSHOFFIC								
160	FSHCLASP	FSHCLASL								
165	FSHOFFIC	FSHOFFIC				DAYSCHED				
170	FSHOFFIC	FSHOFFIC								
175	FSHOFFIC	FSHOFFIC								
180	FSHOFFIC	FSHOFFIC								
185	FSHOFFIC	FSHOFFIC								
190	FSHOFFIC	FSHOFFIC				DAYSCHED				

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Ballast Factor	Percent		--- Daylighting ---	
							Fixture Type			Lights to Ret. Air	Reference Point 1	Reference Point 2	
100	175	SF-PERS	250	200	2	WATT-SF	ASHRAE2						
105	25	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2						
110	48	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
115	48	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
125	17	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
130	4	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2						
135	15	PEOPLE	250	200	1.8	WATT-SF	ASHRAE2						
140	15	PEOPLE	250	200	0.6	WATT-SF	ASHRAE2						
145	1	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2						

## Card 27----- People and Lights -----

Room	People	People	People	People	Lighting	Lighting	Lighting		Percent	--- Daylighting ---	
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2
150	2	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2				
155	8	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2				
160	40	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2				
165	15	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
170	12	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
175	5	PEOPLE	250	200	1.25	WATT-SF	ASHRAE2				
180	6	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2				
185	6	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2				
190	25	PEOPLE	250	200	1.25	WATT-SF	ASHRAE2				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Number	Descrip									
100	1	COMPUTERS	1	WATT-SF	FSHOFFIC	NONE					
105	1	MUSEUM EQ.	1.2	WATT-SF	FSHMUSL	NONE					
110	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE					
115	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE					
125	1	OFFICE EQ.	2.0	WATT-SF	FSHOFFIC	NONE					
130	1	OFFICE EQ.	0.3	WATT-SF	FSHOFFIC	NONE					
135	1	OFFICE EQ.	0.3	WATT-SF	FSHOFFIC	NONE					
140	1	OFFICE EQ.	0.8	WATT-SF	FSHOFFIC	NONE					
145	1	OFFICE EQ.	1.0	WATT-SF	FSHOFFIC	NONE					
150	1	OFFICE EQ.	1.0	WATT-SF	AVAIL	NONE					
155	1	OFFICE EQ.	1.7	WATT-SF	FSHOFFIC	NONE					
160	1	CLASS EQ.	0.5	WATT-SF	FSHCLASL	NONE					
165	1	OFFICE EQ.	1.8	WATT-SF	FSHOFFIC	NONE					
170	1	OFFICE EQ.	1.0	WATT-SF	FSHOFFIC	NONE					
175	1	OFFICE EQ.	2.3	WATT-SF	FSHOFFIC	NONE					
180	1	OFFICE EQ.	2.7	WATT-SF	FSHOFFIC	NONE					
185	1	OFFICE EQ.	2.8	WATT-SF	FSHOFFIC	NONE					
190	1	OFFICE EQ.	1.5	WATT-SF	FSHOFFIC	NONE					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----		-----Heating-----		-----Infiltration-----		-----Heating-----		--Reheat Minimum--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
100	20	CFM-P	20	CFM-P						
105	20	CFM-P	20	CFM-P						
110	20	CFM-P	20	CFM-P						
115	20	CFM-P	20	CFM-P						
125	20	CFM-P	20	CFM-P						
130	20	CFM-P	20	CFM-P						

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
135	20	CFM-P	20	CFM-P						
140	20	CFM-P	20	CFM-P						
145	20	CFM-P	20	CFM-P						
150	20	CFM-P	20	CFM-P						
155	20	CFM-P	20	CFM-P						
160	15	CFM-P	15	CFM-P						
165	20	CFM-P	20	CFM-P						
170	20	CFM-P	20	CFM-P						
175	20	CFM-P	20	CFM-P						
180	20	CFM-P	20	CFM-P						
185	20	CFM-P	20	CFM-P						
190	990	CFM	990	CFM						

Card 31----- Partition Parameters -----									
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No
160	1	48	13	0.14	64	HRLYOADB			
165	1	70	13	0.32	64	HRLYOADB			
170	1	70	13	0.32	64	HRLYOADB			

Card 33----- External Shading -----									
-----OVERHANG-----					-----VERTICAL FINS-----				
Shading	Height		Projection		Left		Right		Adjacent
Glass	Above	Projection	Glass	Projection	Projection	Projection	Projection	Projection	Building
Type	Height	Glass	Out	Width	Left	Out	Right	Out	Flag
3	5	2	8						

----- System Section Alternative #2 -----

Card 39- System Alternative

Number	Description
2	ECO A-INSTALL EMS AIRSIDE EQ

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System	Ventil				Fan		
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	SZ						

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System	Set	System	Ventil	Deck	Cooling	Heating	Cooling	Heating	Fan	Static
Number	Type	Location	SADEVh	SADEVh	Schedule	Schedule	Schedule	Schedule	Pressure	
2	COMP									
3	SZ									
4	MZ									
5	FC									
6	PTAC									
7	PTAC									
8	PTAC									
9	PTAC									
10	SZ									
11	PTAC									
12	PTAC									
13	PTAC									
14	PTAC									
15	FC									
16	FC									
17	MZ									

Card 41----- Zone Assignment -----

System

Set	Ref #1	Ref #2	Ref #3	Ref #4	Ref #5	Ref #6
Number	Begin	End	Begin	End	Begin	End
1	100	100				
2	105	105				
3	110	110				
4	115	115				
5	125	125				
6	130	130				
7	135	135				
8	140	140				
9	145	145				
10	150	150				
11	155	160				
12	165	165				
13	170	170				
14	175	175				
15	180	180				
16	185	185				
17	190	190				

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.0	1.0									
2	1										
3	1										
4	1										
5	1										
6	1										
7	1										
8	1										
9	1										
10	1										
11	1										
12	1										
13	1										
14	1										
15	1										
16	1										
17	2										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	OFF					OFF	OFF	OFF		
2						FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8						FTSAMHTG	FTSAMHTG	FTSAMHTG		
9						FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11						FTSAMHTG	FTSAMHTG	FTSAMHTG		
12						FTSAMHTG	FTSAMHTG	FTSAMHTG		
13						FTSAMHTG	FTSAMHTG	FTSAMHTG		
15	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
16	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
17						FTSAMHTG	FTSAMHTG	FTSAMHTG		

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1			OPSTART	OPSTOP					
3			OPSTART	OPSTOP					
4			OPSTART	OPSTOP					
5			OPSTART	OPSTOP					
12			OPSTART	OPSTOP					
17			OPSTART	OPSTOP					

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description	--- Demand Limit --- Temperature Schedule	Drift
2				ECO A-INSTALL EMS WATERSIDE EQ		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn Ref	Loads To Cool Ref	Equipment Sizing	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End	
1	1	BLKPLANT	1	1								
2	2	BLKPLANT	2	2								
3	3	BLKPLANT	3	3								
4	4	BLKPLANT	4	4								
5	5	BLKPLANT	5	5								
6	7	BLKPLANT	6	6								
7	8	BLKPLANT	7	7								
8	9	BLKPLANT	8	8								
9	10	BLKPLANT	9	9								
10	11	BLKPLANT	10	10								
11	12	BLKPLANT	11	11								
12	13	BLKPLANT	12	12								
13	15	BLKPLANT	13	13								
14	16	BLKPLANT	14	14								
15	17	BLKPLANT	15	16								
16	18	BLKPLANT	17	17								

## Card 62----- Cooling Equipment Parameters -----

Cool Equip Ref	Equip Code	Num Of	-----COOLING-----				-----HEAT RECOVERY-----				Seq Order	Demand Seq	Limit Number
Num	Name	Units	--Capacity-- Value	Units	Value	Units	--Capacity-- Value	Units	Value	Units	Num	Type	Number
1	EQ1113	1	10	TONS	17.6	KW							
2	EQ1132L	1	35	TONS	39.8	KW							
3	ACC1	1	40	TONS	58.5	KW							
4	ACC1	1	29	TONS	37.8	KW							
5	ACC1	1	3	TONS	6.1	KW					1	PAR	
6	ACC1	1	25	TONS	46	KW					2	PAR	
7	EQ1307	1	3	TONS	4.2	KW							
8	EQ1307	1	6	TONS	8.2	KW							
9	EQ1307	1	10.5	TONS	15.5	KW							
10	EQ1307	1	3	TONS	3.7	KW							
11	EQ1113	1	3	TONS	3.8	KW							
12	EQ1307	1	12	TONS	14.0	KW							
13	EQ1113	1	5	TONS	10.3	KW					1	PAR	
14	EQ1307	1	12	TONS	16.8	KW					2	PAR	

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand	
Ref Code	Of	--Capacity--		----Energy----		--Capacity--		----Energy----		Order	Seq	Limit
Num Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
15 EQ1307	1	8	TONS	11.2	KW							
16 EQ1307	1	3	TONS	3.7	KW							
17 ACC1	1	15	TONS	27	KW							
18 ACC1	1	20	TONS	27.3	KW							

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	.75	KW		
2			2.2	KW
3	1.49	KW		
4	2.24	KW		
6	2.38	KW		
13	0.56	KW		
17	0.37	KW		
18	0.56	KW		

Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	1	1								
2	2	2	2								
3	3	3	3								
4	4	4	4								
5	5	5	5								
6	6	6	6								
7	7	7	7								
8	8	8	8								
9	9	9	9								
10	10	10	10								
11	11	11	11								
12	12	12	12								
13	13	13	13								
14	14	14	14								
15	15	15	16								
16	16	17	17								





## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				-----DEMAND LIMIT			PRIORITY---	
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
15	0.7											
16	0.7											
17	6.3											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTR. LOSS	0	MBH	FTSAMHTG	HOT-LD	1			
3	DISTR. LOSS	0.24	TONS	FTSAMCLG	CHILL-LD	2			
4	DISTR. LOSS	2.75	MBH	FTSAMHTG	HOT-LD	2			
5	DISTR. LOSS	0.95	TONS	FTSAMCLG	CHILL-LD	3			
6	DISTR. LOSS	5.65	MBH	FTSAMHTG	HOT-LD	3			
7	DISTR. LOSS	1.17	TONS	FTSAMCLG	CHILL-LD	4			
8	DISTR. LOSS	5.65	MBH	FTSAMHTG	HOT-LD	4			
9	DISTR. LOSS	1.14	TONS	FTSAMCLG	CHILL-LD	5			
10	DISTR. LOSS	3.85	MBH	FTSAMHTG	HOT-LD	5			
11	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	6			
12	DISTR. LOSS	0.6	MBH	FTSAMHTG	HOT-LD	6			
13	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	7			
14	DISTR. LOSS	1.0	MBH	FTSAMHTG	HOT-LD	7			
15	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	8			
16	DISTR. LOSS	1.0	MBH	FTSAMHTG	HOT-LD	8			
17	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	9			
18	DISTR. LOSS	0.5	MBH	FTSAMHTG	HOT-LD	9			
19	DISTR. LOSS	0.06	TONS	FTSAMCLG	CHILL-LD	10			
20	DISTR. LOSS	0	MBH	FTSAMHTG	HOT-LD	10			
21	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	11			
22	DISTR. LOSS	2.8	MBH	FTSAMHTG	HOT-LD	11			
23	DISTR. LOSS	0.45	TONS	FTSAMCLG	CHILL-LD	12			
24	DISTR. LOSS	2.0	MBH	FTSAMHTG	HOT-LD	12			
25	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	13			
26	DISTR. LOSS	2.1	MBH	FTSAMHTG	HOT-LD	13			
27	DISTR. LOSS	0	TONS	FTSAMCLG	CHILL-LD	14			
28	DISTR. LOSS	0.8	MBH	FTSAMHTG	HOT-LD	14			
29	DISTR. LOSS	0.1	TONS	FTSAMCLG	CHILL-LD	15			
30	DISTR. LOSS	1.6	MBH	FTSAMHTG	HOT-LD	15			
31	DISTR. LOSS	0.3	TONS	FTSAMCLG	CHILL-LD	16			
32	DISTR. LOSS	2.9	MBH	FTSAMHTG	HOT-LD	16			



## Utility Description Reference Table

## Schedules:

BARRSCHD COOLING FAN SCHEDULE CODE FOR BARACKS  
DAYSCHED COOLING FAN SCHEDULE CODE  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHMUSP F.S.H. MUSEUM PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
OFF ALWAYS OFF  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE  
OPSTPB OPTIMUM STOP COOLING FAN SCHED. CODE  
OPSTRTB OPTIMUM START COOLING FAN SCHED. CODE

## System:

FC FAN COIL SYSTEM  
MZ MULTIZONE SYSTEM  
PTAC PACKAGED TERMINAL A.C. SYSTEM  
SZ SINGLE ZONE SYSTEM

## Equipment:

## Cooling:

ACC1 TYPICAL AIR COOLED RECIP CHILLER  
ACC2 TYPICAL AIR COOLED RECIP CHILLER  
EQ1113 AIR-CLD RECIPROCATING < 15 TONS  
EQ1161 AIR COOLED COND COMP < 15 TONS  
EQ1307 PACKAGED TERMINAL AIR CONDITIONER

## Heating:

BOILERWT WATERTUBE BOILER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN  
EQ2454 RESIDENTIAL GAS FURNACE WITH FAN  
STEAMBLR STEAM BOILER

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP  
EQ5240 BOILER FORCED DRAFT FAN  
HUMIDIF HUMIDIFIER

Schedule Name: BARRSCHD  
Project: COOLING FAN SCHEDULE CODE FOR B  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour	Util Percent
0	100
8	0
17	100
24	

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0 0

6 100

17 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 0

12 100

16 0

24

Schedule Name: FSHBARRL  
Project: F.S.H. BARRACKS LIGHT\MISC. SCH  
Location: F.S.H. - SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHT

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	5	
17	80	
22	5	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	5	
8	50	
22	5	
24		

Schedule Name: FSHBARRP  
Project: F.S.H. BARRACKS PEOPLE SCHEDULE  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR BARRACKS

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		100
8		0
17		80
22		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		50
24		



Schedule Name: FSHMUSP  
Project: F.S.H. MUSEUM PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	0
10	45
16	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
10	100
16	0
24	

Schedule Name: FSHOFFIC

Project: F.S.H. OFFICE INTERNAL LOAD SCH

Location: F.S.H. SAN ANTONIO, TEXAS

Client: CORPS OF ENGRS,PUBLIC WORKS DIRE

Program User: HUITT ZOLLARS, INC. - JTC,

Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 0

8 100

12 10

13 100

17 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Schedule Name: OFF  
Project: ALWAYS OFF  
Location:  
Client:  
Program User:  
Comments:

Starting Month: JAN Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0		0
24		

Schedule Name: OPSTART

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0		0
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0		0
6	100	
7		0
24		

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0	0	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0	0	
16	100	
17	0	
24		

Schedule Name: OPSTPB

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DET AMOUNT OF TIME FAN OF IN B

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0		0
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0		0
7	100	
8		0
24		



Schedule Name: OPSTRTB

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DET AMOUNT OF TIME FOR FAN ON

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0		0
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0		0
16		100
17		0
24		

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
DAYSCHED COOLING FAN SCHEDULE CODE  
FSHCLASL F.S.H. CLASSROOM LIGHTING SCHEDULE  
FSHCLASP F.S.H. CLASSROOM PEOPLE SCHEDULE  
FSHMUSL F.S.H. MUSEUM LIGHTING SCHEDULE  
FSHMUSP F.S.H. MUSEUM PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
OFF ALWAYS OFF  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE

## System:

COMP COMPUTER ROOM SYSTEM  
FC FAN COIL SYSTEM  
MZ MULTIZONE SYSTEM  
PTAC PACKAGED TERMINAL A.C. SYSTEM  
SZ SINGLE ZONE SYSTEM

## Equipment:

## Cooling:

ACC1 TYPICAL AIR COOLED RECIP CHILLER  
EQ1113 AIR-CLD RECIPROCATING < 15 TONS  
EQ1132L WATER COOLED SELF CONTAINED > 15 TONS  
EQ1307 PACKAGED TERMINAL AIR CONDITIONER

## Heating:

BOILERWT WATERTUBE BOILER  
EQ2201 GAS FIRED UNIT HEATER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP  
HUMIDIF HUMIDIFIER

Schedule Name: AVAIL

Project: AVAILABLE (100)

Location:

Client: VERSION 3.0

Program User: C.D.S. MARKETING

Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0	0
6	100
17	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
12	100
16	0
24	

Schedule Name: FSHCLASL  
Project: F.S.H. CLASSROOM LIGHTING SCHE  
Location: EEAP BOILER CHILLER STUDY  
Client: CORP OF ENGINEERS, PUBLIC WAOEKS  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
10 0  
13 100  
14 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHCLASP  
Project: F.S.H CLASSROOM PEOPLE SCHEDULE  
Location: EEAP BOILER CHILLER STUDY  
Client: CORP OF ENGINEERS, PUBLIC WORKS  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
10 0  
13 50  
14 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHMUSL  
Project: P.S.H. MUSEUM LIGHTING SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	0
10	100
16	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
10	100
16	0
24	

Schedule Name: FSHMUSP  
Project: F.S.H. MUSEUM PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
10 45  
16 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
10 100  
16 0  
24



Schedule Name: FSHOFFIC

Project: F.S.H. OFFICE INTERNAL LOAD SCH

Location: F.S.H. SAN ANTONIO, TEXAS

Client: CORPS OF ENGRS,PUBLIC WORKS DIRE

Program User: HUITT ZOLLARS, INC. - JTC,

Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
12 10  
13 100  
17 0  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: OFF  
Project: ALWAYS OFF  
Location:  
Client:  
Program User:  
Comments:

Starting Month: JAN Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: OPSTART

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0	0	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0	0	
6	100	
7	0	
24		

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 0  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
16 100  
17 0  
24

## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
2	EQ5020	1.12	KW									
3	EQ5001	2.24	KW									
4	EQ5020	1.12	KW									
5	EQ5001	2.24	KW									
6	EQ5001	0.37	KW									
7	EQ5020	0.56	KW									
8	EQ5020	0.37	KW									
9	HUMIDIF	6.0	KW		FSHMUSP							

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Alternative Description	Demand Limit	Temperature
Number	Time of Day	Time of Day	Limit			
	Schedule	Schedule	Max KW		Schedule	Drift
2				ECO B1 - WATER COOLED CENTRIFUGAL		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	BLKPLANT	1	36								

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	Value	Units	--Capacity--	Value	Units	Value	Units	Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008S	1	170	TONS	105	KW					1	PAR	
2	EQ1008L	1	480	TONS	264	KW					2	PAR	

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	14.9	KW	11.2	KW			1		1	
2	37.3	KW	29.8	KW			1		2	

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	DISTRIBUTION LOS	15.3	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	10.06	TONS	FTSAMCLG	CHILL-LD	2			

## Card 72-- Switchover Controls -----

Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	170	TONS		

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			
2	EQ5100			18.6	KW	T-WATER	CTOWER	1			

## ----- Equipment Section Alternative #3 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description	----- Demand Limit --- Temperature Schedule Drift
3				ECO B2 - WATER COOLED CENTRIFUGAL VFD	

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	BLKPLANT	1 36									

## Card 62----- Cooling Equipment Parameters -----

Cool Equip Ref	Equip Code	Num Of	-----COOLING----- --Capacity--	-----Energy----	-----HEAT RECOVERY----- --Capacity--	-----Energy----	Seq Order	Seq Type	Demand Limit Number
Num	Name	Units	Value	Units	Value	Units	Value	Units	
1	EQ1008S	1	170	TONS	105	KW			1 PAR
2	EQ1009	1	480	TONS	264	KW			2 PAR



## Card 63----- Cooling Pumps and References -----

Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	14.9	KW	11.2	KW			1		1	
2	37.3	KW	29.8	KW			1		2	

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	15.3	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	10.06	TONS	FTSAMCLG	CHILL-LD	2			

## Card 72-- Switchover Controls -----

Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	170	TONS		

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling		Energy	Energy	Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower
Ref	Code	Value	Units	Value	Units	Type	Type
1	EQ5100			14.9	KW	T-WATER	CTOWER
2	EQ5100			18.6	KW	T-WATER	CTOWER

## ----- Equipment Section Alternative #4 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand		---- Demand Limit ---
Number	Time of Day	Time of Day	Limit		Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule
4				ECO B3 - WATER COOLED SCREW	

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling									
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	BLKPLANT	1	36							

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008S	1	170	TONS	105	KW					1	PAR	
2	YSCRW22	1	480	TONS	307	KW					2	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		-----CONDENSER-----		---HT REC or AUX---		Switch-				
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.	
1	14.9	KW	11.2	KW			1		1		
2	37.3	KW	29.8	KW			1		2		

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	15.3	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	10.06	TONS	FTSAMCLG	CHILL-LD	2			

Card 72-- Switchover Controls -----

Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	170	TONS		

Card 74----- Condenser / Cooling Tower Parameters -----

	Cooling		Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd
1	EQ5100			14.9	KW	T-WATER	CTOWER	1	Energy
2	EQ5100			18.6	KW	T-WATER	CTOWER	1	Energy

## Card 75----- Miscellaneous Accessory -----

#1				#2				#3			
Misc	Equip	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Value	Units	Code	Code	Value	Units	Code
2	EQ5020	1.12	KW								
3	EQ5001	2.24	KW								
4	EQ5020	1.12	KW								
5	EQ5001	2.24	KW								
6	EQ5001	0.37	KW								
7	EQ5020	0.56	KW								
8	EQ5020	0.37	KW								
9	HUMIDIF	6.0	KW								

FSHMUSP

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Temperature
Number	Time of Day	Time of Day	Limit	Drift
	Schedule	Schedule	Max KW	
2				

ECO B4 - GAS ENGINE DRIVEN CHILLER

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Asgn	Loads To	Equipment	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
Ref	Cool Ref	Sizing									
1	1		1	36							

## Card 62----- Cooling Equipment Parameters -----

Cool Equip		Num	---COOLING---				---HEAT RECOVERY---				Seq	Demand	
Ref	Code	Of	--Capacity--	Value	Units	Value	Units	--Capacity--	Value	Units	Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008S	1	170	TONS	105	KW					1		
2	EDC80TON	1	480	TONS	3168	MBH					2		

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	14.9	KW	11.2	KW
2	37.3	KW	29.8	KW

over Cold Cooling Misc.  
Control Storage Tower Access.

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	DISTRIBUTION LOS	15.3	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	10.1	TONS	FTSAMCLG	CHILL-LD	2			

## Card 72-- Switchover Controls -----

Control Reference	Load Value	Load Units	Air DB	Sched Code
1	170	TONS		

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling		Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Value	Low Spd Energy Units
	Tower Code	Capacity Value									
1	EQ5100			14.9	KW	T-WATER	CTOWER				
2	EQ5100			22.4	KW	T-WATER	CTOWER	1			

## ----- Equipment Section Alternative #3 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Time of Day Schedule	Elec Consump Schedule	Elec Demand Schedule	Demand Limit	Alternative Description	Demand Limit Temperature
3					ECO C - REPLACE BLRS WITH BOILER PLANT	

## Card 65----- Heating Load Assignment -----

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1	36							

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y Value	Energy Rate	Seq Order	Switch over	Hot Strg	Misc. Acc.	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Number	Control	Cogen	Number
1	BOILHEFT	1	7.5	KW	1830	MBH	2000	MBH	1	
2	BOILHEFT	1	7.5	KW	1830	MBH	2000	MBH	2	

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	112.8	MBH	FTSAMHTG	HOT-LD	1			

Utility Description Reference Table  
-----

## Schedules:

AVAIL AVAILABLE (100%)  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHCLASL F.S.H. CLASSROOM LIGHTING SCHEDULE  
FSHCLASP F.S.H. CLASSROOM PEOPLE SCHEDULE  
FSHMUSL F.S.H. MUSEUM LIGHTING SCHEDULE  
FSHMUSP F.S.H. MUSEUM PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
OFF ALWAYS OFF

## System:

COMP COMPUTER ROOM SYSTEM  
FC FAN COIL SYSTEM  
MZ MULTIZONE SYSTEM  
SZ SINGLE ZONE SYSTEM

## Equipment:

## Cooling:

ACC1 TYPICAL AIR COOLED RECIP CHILLER  
ACC2 TYPICAL AIR COOLED RECIP CHILLER  
EDC80TON ENGINE DRIVEN CHILLER, 80 TONS  
EQ1008S 3-STG CENTRIFUGAL < 300 TONS  
EQ1113 AIR-CLD RECIPROCATING < 15 TONS  
EQ1132L WATER COOLED SELF CONTAINED > 15 TONS  
EQ1161 AIR COOLED COND COMP < 15 TONS  
EQ1307 PACKAGED TERMINAL AIR CONDITIONER

## Heating:

BOILERWT WATERTUBE BOILER  
BOILHFT HIGH EFFICIENCY MODULAR FIRETUBE BOIL.  
EQ2201 GAS FIRED UNIT HEATER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN  
EQ2454 RESIDENTIAL GAS FURNACE WITH FAN  
STEAMBLR STEAM BOILER

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP  
EQ5240 BOILER FORCED DRAFT FAN  
HUMIDIF HUMIDIFIER

```
*****
*****
**
**          T R A C E    6 0 0    A N A L Y S I S          **
**
**          by  HUITT & ZOLLARS          **
**
*****
*****
```

030185.06 EEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON, TEXAS  
CORPS. OF ENGINEERS - FORT WORTH, TX.  
HUITT-ZOLLARS INC.  
AREA 100

## Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 15:21:15 2/20/96  
Dataset Name: FSH100A .TM

## SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1

## AREA 100 EXISTING SYSTEMS

## ----- SYSTEM LOAD PROFILE -----

## System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	25.9	15	668	-160,082	55	1,120	13,776.1	0	0	0.0	0	0
5 - 10	51.8	10	442	-320,164	17	349	27,552.2	0	0	0.0	0	0
10 - 15	77.7	12	518	-480,246	7	144	41,328.3	0	0	0.0	0	0
15 - 20	103.6	6	283	-640,328	4	91	55,104.4	0	0	0.0	0	0
20 - 25	129.5	6	255	-800,409	3	66	68,880.5	0	0	0.0	0	0
25 - 30	155.3	7	312	-960,492	4	73	82,656.7	0	0	0.0	0	0
30 - 35	181.2	8	344	-1,120,574	3	56	96,432.8	0	0	0.0	0	0
35 - 40	207.1	7	299	-1,280,656	3	70	110,208.9	0	0	0.0	0	0
40 - 45	233.0	7	326	-1,440,737	2	46	123,985.0	0	0	0.0	0	0
45 - 50	258.9	6	262	-1,600,819	1	30	137,761.1	0	0	0.0	0	0
50 - 55	284.8	5	216	-1,760,901	0	0	151,537.2	0	0	0.0	0	0
55 - 60	310.7	5	212	-1,920,983	0	0	165,313.3	0	0	0.0	0	0
60 - 65	336.6	3	148	-2,081,065	0	0	179,089.4	0	0	0.0	0	0
65 - 70	362.5	1	45	-2,241,147	0	0	192,865.6	0	0	0.0	0	0
70 - 75	388.4	2	86	-2,401,229	0	0	206,641.7	0	0	0.0	0	0
75 - 80	414.3	0	0	-2,561,311	0	0	220,417.7	0	0	0.0	0	0
80 - 85	440.1	0	0	-2,721,393	0	0	234,193.9	0	0	0.0	0	0
85 - 90	466.0	0	0	-2,881,475	0	0	247,970.0	0	0	0.0	0	0
90 - 95	491.9	0	0	-3,041,557	0	0	261,746.1	0	0	0.0	0	0
95 - 100	517.8	0	0	-3,201,639	0	0	275,522.2	100	8,760	0.0	0	0
Hours Off	0.0	0	4,344	0	0	6,715	0.0	0	0	0.0	0	8,760



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	74860	67694	79738	71659	77299	76537	72421	79738	71659	77299	71659	72421	892,986
	PK	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	945	914	945	945	914	945	0	0	5,608
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
2		BASE UTILITY												
	HOTLD	55	49	55	53	0	0	0	0	0	0	53	55	319
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3		BASE UTILITY												
	CHILLD	0	0	0	0	982	950	982	982	950	982	0	0	5,829
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
4		BASE UTILITY												
	HOTLD	55	49	55	53	0	0	0	0	0	0	53	55	320
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6		BASE UTILITY												
	HOTLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7		BASE UTILITY												
	CHILLD	0	0	0	0	618	598	618	618	598	618	0	0	3,665
	PK	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.8
8		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	263
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
9		BASE UTILITY												
	CHILLD	0	0	0	0	662	641	662	662	641	662	0	0	3,930
	PK	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.9
10		BASE UTILITY												
	HOTLD	33	30	33	32	0	0	0	0	0	0	32	33	195
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11		BASE UTILITY												
	CHILLD	0	0	0	0	967	936	967	967	936	967	0	0	5,741
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
12		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
13		BASE UTILITY												
	CHILLD	0	0	0	0	967	936	967	967	936	967	0	0	5,741
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
14		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
15		BASE UTILITY												
	CHILLD	0	0	0	0	1034	1001	1034	1034	1001	1034	0	0	6,138
	PK	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	1.4

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## BASE CASE

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
16		BASE UTILITY												
	HOTLD	53	48	53	51	0	0	0	0	0	0	51	53	308
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
17		BASE UTILITY												
	CHILLD	0	0	0	0	729	706	729	729	706	729	0	0	4,328
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
18		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
19		BASE UTILITY												
	CHILLD	0	0	0	0	1473	1426	1473	1473	1426	1473	0	0	8,744
	PK	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	2.0
20		BASE UTILITY												
	HOTLD	37	34	37	36	0	0	0	0	0	0	36	37	217
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
21		BASE UTILITY												
	HOTLD	37	34	37	36	0	0	0	0	0	0	36	37	217
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
22		BASE UTILITY												
	CHILLD	0	0	0	0	774	749	774	774	749	774	0	0	4,593
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
23		BASE UTILITY												
	HOTLD	41	37	41	39	0	0	0	0	0	0	39	41	237
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
24		BASE UTILITY												
	CHILLD	0	0	0	0	394	382	394	394	382	394	0	0	2,340
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5
25		BASE UTILITY												
	HOTLD	15	13	15	14	0	0	0	0	0	0	14	15	85
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26		BASE UTILITY												
	CHILLD	0	0	0	0	536	518	536	536	518	536	0	0	3,180
	PK	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
27		BASE UTILITY												
	HOTLD	26	24	26	26	0	0	0	0	0	0	26	26	154
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28		BASE UTILITY												
	CHILLD	0	0	0	0	82	79	82	82	79	82	0	0	486
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
29		BASE UTILITY												
	HOTLD	6	6	6	6	0	0	0	0	0	0	6	6	37
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30		BASE UTILITY												
	CHILLD	0	0	0	0	2232	2160	2232	2232	2160	2232	0	0	13,248
	PK	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0	3.0
31		BASE UTILITY												
	HOTLD	92	83	92	89	0	0	0	0	0	0	89	92	535
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldgs. 122 & 140 CHW Equipment														
1	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	15120	19579	23866	24162	16528	6334	0	0	105,589
	PK	0.0	0.0	0.0	0.0	53.2	59.2	63.7	62.9	53.4	38.7	0.0	0.0	63.7
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
Bldgs. 124 & 125 CHW Equipment														
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	16392	21165	25864	26109	17674	6823	0	0	114,027
	PK	0.0	0.0	0.0	0.0	58.7	65.2	69.7	68.4	58.3	42.8	0.0	0.0	69.7
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
Bldg. 128 CHW Equipment														
3	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 133 CHW Equipment														
4	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	11457	14617	17770	18011	12718	4872	0	0	79,446
	PK	0.0	0.0	0.0	0.0	36.9	41.7	44.8	44.4	38.3	27.1	0.0	0.0	44.8
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldgs 134 & 135 CHW Equipment														
5	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	16477	19379	22657	23193	17739	9641	0	0	109,087
	PK	0.0	0.0	0.0	0.0	49.6	51.8	53.8	53.3	49.8	45.5	0.0	0.0	53.8
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	275	266	275	275	266	275	0	0	1,634
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## BASE CASE

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldg. 143 CHW Equipment														
6	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	15276	19424	23279	23889	16863	7952	0	0	106,683
	PK	0.0	0.0	0.0	0.0	56.9	61.9	66.7	67.5	58.5	45.7	0.0	0.0	67.5
6	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
6	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 144 CHW Equipment														
7	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	1496	1833	2082	2121	1802	787	0	0	10,120
	PK	0.0	0.0	0.0	0.0	4.4	4.5	4.5	4.7	4.9	3.4	0.0	0.0	4.9
7	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1389	1613	1667	1667	1613	784	0	0	8,732
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
7	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	620	720	744	744	720	350	0	0	3,898
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
8	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	11596	15650	19098	19693	12874	4913	0	0	83,823
	PK	0.0	0.0	0.0	0.0	52.3	56.8	61.2	61.9	53.7	41.9	0.0	0.0	61.9
8	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	842	1124	1319	1319	963	383	0	0	5,952
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
8	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	376	502	589	589	430	171	0	0	2,657
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 145 CHW Equipment														
9	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	0	0	6922	8920	10790	11299	7563	3261	0	0	48,756
	PK	0.0	0.0	0.0	0.0	51.9	54.0	56.0	55.5	52.0	48.6	0.0	0.0	56.0
9	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	0	0	985	1267	1850	1590	1089	444	0	0	7,225
	PK	0.0	0.0	0.0	0.0	4.8	5.2	7.4	7.4	5.0	3.8	0.0	0.0	7.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
9	EQ5308	CONTROLS												
	ELEC	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
		Bldg. 146 CHW Equipment												
10	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	15246	19561	23652	24176	16874	7430	0	0	106,939
	PK	0.0	0.0	0.0	0.0	54.7	59.5	64.2	64.9	56.2	44.1	0.0	0.0	64.9
10	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
10	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldgs. 147 & 149 CHW Equipment												
11	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	26404	31977	38339	37949	28706	12665	0	0	176,040
	PK	0.0	0.0	0.0	0.0	81.0	86.4	89.6	88.9	82.6	70.8	0.0	0.0	89.6
11	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2775	2686	2775	2775	2686	2775	0	0	16,472
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
11	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldg. 197 CHW Equipment												
12	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	15672	19249	23126	23691	16723	7795	0	0	106,257
	PK	0.0	0.0	0.0	0.0	56.1	61.1	65.6	65.9	57.7	45.7	0.0	0.0	65.9
12	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
12	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldg. 198 CHW Equipment												
13	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	2962	3678	4430	4628	3232	1433	0	0	20,362
	PK	0.0	0.0	0.0	0.0	13.2	14.1	14.7	14.5	13.6	10.1	0.0	0.0	14.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
13	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	395	488	619	609	436	184	0	0	2,731
	PK	0.0	0.0	0.0	0.0	1.7	1.8	1.8	1.8	1.8	1.4	0.0	0.0	1.8
13	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
13	EQ5313	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
Bldg. 199 CHW Equipment														
14	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	6607	8398	10193	10463	7427	3171	0	0	46,260
	PK	0.0	0.0	0.0	0.0	21.6	24.1	26.4	26.6	22.7	16.4	0.0	0.0	26.6
14	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
14	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 127 CHW Equipment														
15	EQ1161	AIR COOLED COND COMP < 15 TONS												
	ELEC	0	0	0	0	1502	1879	2276	2296	1578	635	0	0	10,166
	PK	0.0	0.0	0.0	0.0	6.6	6.9	7.1	7.1	6.6	6.1	0.0	0.0	7.1
15	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	140	175	222	213	149	58	0	0	956
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.4	0.0	0.0	0.6
15	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
Bldg. 250 CHW Equipment														
16	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	48240	56599	66632	67236	52725	24198	0	0	315,629
	PK	0.0	0.0	0.0	0.0	140.8	150.4	162.3	166.0	145.0	110.5	0.0	0.0	166.0
16	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	4166	4032	4166	4166	4032	4166	0	0	24,730
	PK	0.0	0.0	0.0	0.0	5.6	5.6	5.6	5.6	5.6	5.6	0.0	0.0	5.6



### BASE CASE

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
16	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	TYPFAN	Bldg 122 fans GENERIC FAN												
	ELEC	6101	5510	6101	5904	6101	5904	6101	6101	5904	6101	5904	6101	71,832
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
2	TYPFAN	Bldg 140 fans GENERIC FAN												
	ELEC	521	470	521	504	521	504	521	521	504	521	504	521	6,132
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
3	TYPFAN	Bldgs. 124 fans GENERIC FAN												
	ELEC	6101	5510	6101	5904	6101	5904	6101	6101	5904	6101	5904	6101	71,832
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
4	TYPFAN	Bldg. 125 fans GENERIC FAN												
	ELEC	11398	10295	11398	11030	11398	11030	11398	11398	11030	11398	11030	11398	134,200
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
5	TYPFAN	Bldg. 128 fans GENERIC FAN												
	ELEC	5580	5040	5580	5400	5580	5400	5580	5580	5400	5580	5400	5580	65,700
	PK	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6	TYPFAN	Bldg. 133 fans GENERIC FAN												
	ELEC	6101	5510	6101	5904	6101	5904	6101	6101	5904	6101	5904	6101	71,832
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
7	TYPFAN	Bldg. 134 fans GENERIC FAN												
	ELEC	12504	11294	12504	12100	12504	12100	12504	12504	12100	12504	12100	12504	147,220
	PK	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
8	TYPFAN	Bldg. 135 fans GENERIC FAN												
	ELEC	12504	11294	12504	12100	12504	12100	12504	12504	12100	12504	12100	12504	147,220
	PK	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
9	TYPFAN	Bldg. 143 fans GENERIC FAN												
	ELEC	12188	11008	12188	11795	12188	11795	12188						



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	678	632	479	403	0	0	0	0	0	0	479	664	3,335
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
1	EQ5311	BOILER CONTROLS												
	ELEC	76	71	53	45	0	0	0	0	0	0	53	74	372
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
Bldgs. 124 & 125 HW Equipment														
2		WATERTUBE BOILER												
	GAS	452	438	112	73	0	0	0	0	0	0	130	431	1,636
	PK	1.8	1.9	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.8	1.9
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	678	614	470	403	0	0	0	0	0	0	479	664	3,308
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
2	EQ5311	BOILER CONTROLS												
	ELEC	76	69	53	45	0	0	0	0	0	0	53	74	369
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
Bldg. 128 HW Equipment														
3		WATERTUBE BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 133 HW Equipment														
4		WATERTUBE BOILER												
	GAS	460	434	100	60	0	0	0	0	0	0	118	425	1,597
	PK	1.5	1.5	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.5	1.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	275	249	275	266	0	0	0	0	0	0	266	275	1,607
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
4	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
4	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	2775	2507	2775	2686	0	0	0	0	0	0	2686	2775	16,203
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
Bldgs 134 & 135 HW Equipment														
5		WATERTUBE BOILER												
	GAS	116	102	46	45	0	0	0	0	0	0	46	106	461
	PK	1.2	1.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	1.3
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	131	117	92	89	0	0	0	0	0	0	89	130	646
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
5	EQ5311	BOILER CONTROLS												
	ELEC	44	39	31	30	0	0	0	0	0	0	30	44	218
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 143 HW Equipment														
6		WATERTUBE BOILER												
	GAS	253	258	83	60	0	0	0	0	0	0	80	226	961
	PK	1.6	1.8	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	1.8
6	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	366	341	300	270	0	0	0	0	0	0	298	357	1,932
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
6	EQ5311	BOILER CONTROLS												
	ELEC	61	57	50	45	0	0	0	0	0	0	50	59	322
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 144 HW Equipment														
7		WATERTUBE BOILER												
	GAS	253	258	83	60	0	0	0	0	0	0	80	226	961
	PK	1.6	1.8	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	1.8
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	366	341	300	270	0	0	0	0	0	0	298	357	1,932
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
7	EQ5311	BOILER CONTROLS												
	ELEC	61	57	50	45	0	0	0	0	0	0	50	59	322
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 145 HW Equipment												
8	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	2288	2305	836	532	0	0	0	0	0	0	812	2068	8,840
	PK	13.7	14.6	9.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	8.3	13.9	14.6
		Bldg. 146 HW Equipment												
9		WATERTUBE BOILER												
	GAS	243	250	76	60	0	0	0	0	0	0	68	212	910
	PK	1.6	1.8	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.7	1.8
9	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	335	326	285	270	0	0	0	0	0	0	273	339	1,828
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
9	EQ5311	BOILER CONTROLS												
	ELEC	56	54	48	45	0	0	0	0	0	0	46	57	305
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 147 HW Equipment												
10		WATERTUBE BOILER												
	GAS	127	132	51	50	0	0	0	0	0	0	50	112	520
	PK	1.3	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.4
10	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	258	232	186	180	0	0	0	0	0	0	180	228	1,264
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
10	EQ5311	BOILER CONTROLS												
	ELEC	43	39	31	30	0	0	0	0	0	0	30	38	211
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 149 HW Equipment												
11		WATERTUBE BOILER												
	GAS	127	132	51	50	0	0	0	0	0	0	50	112	520
	PK	1.3	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.4
11	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	258	232	186	180	0	0	0	0	0	0	180	228	1,264
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
11	EQ5311	BOILER CONTROLS												
	ELEC	43	39	31	30	0	0	0	0	0	0	30	38	211
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 197 HW Equipment														
12	WATERTUBE BOILER													
	GAS	189	183	46	45	0	0	0	0	0	0	47	162	672
	PK	1.4	1.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	1.5
12	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	175	180	93	90	0	0	0	0	0	0	93	170	802
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
12	EQ5311	BOILER CONTROLS												
	ELEC	29	30	15	15	0	0	0	0	0	0	15	28	134
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 198 HW Equipment														
13	WATERTUBE BOILER													
	GAS	78	73	22	19	0	0	0	0	0	0	22	72	285
	PK	0.5	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.6
13	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	165	156	106	101	0	0	0	0	0	0	105	171	804
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
13	EQ5311	BOILER CONTROLS												
	ELEC	37	35	24	23	0	0	0	0	0	0	23	38	180
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 199 HW Equipment														
14	WATERTUBE BOILER													
	GAS	238	230	61	35	0	0	0	0	0	0	70	228	862
	PK	1.0	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.0
14	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	833	753	833	806	0	0	0	0	0	0	806	833	4,865
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
14	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 127 HW Equipment														
15	EQ2454	RESIDENTIAL GAS FURNACE WITH FAN												
	GAS	38	34	9	8	0	0	0	0	0	0	11	36	136
	PK	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
15	EQ5254	RESIDENTIAL FURNACE FAN												
	ELEC	540	488	540	523	0	0	0	0	0	0	523	540	3,154
	PK	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
 BASE CASE

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldg. 250 HW Equipment														
16		STEAM BOILER												
	GAS	222	226	126	122	0	0	0	0	0	0	122	208	1,027
	PK	1.8	2.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	2.1
16	EQ5311	BOILER CONTROLS												
	ELEC	56	52	47	45	0	0	0	0	0	0	45	56	300
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

\*\*\*\*\*  
\*\*\*\*\*  
\*\*  
\*\* T R A C E 6 0 0 A N A L Y S I S \*\*  
\*\*  
\*\* by HUITT & ZOLLARS \*\*  
\*\*  
\*\*\*\*\*  
\*\*\*\*\*

030185.06 EEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON, TEXAS  
CORPS. OF ENGINEERS - FORT WORTH, TX.  
HUITT-ZOLLARS INC.  
AREA 100

Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 10:52: 7 2/21/96  
Dataset Name: FSH100B .TM



SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	9.7	38	2,565	-65,644	43	1,016	5,851.6	0	0	0.0	0	0
5 - 10	19.3	8	524	-131,287	19	456	11,703.2	0	0	0.0	0	0
10 - 15	29.0	8	529	-196,931	12	276	17,554.8	0	0	0.0	0	0
15 - 20	38.7	8	525	-262,574	7	158	23,406.5	0	0	0.0	0	0
20 - 25	48.3	6	379	-328,218	4	87	29,258.1	0	0	0.0	0	0
25 - 30	58.0	6	374	-393,861	3	73	35,109.7	0	0	0.0	0	0
30 - 35	67.6	5	312	-459,505	2	53	40,961.3	0	0	0.0	0	0
35 - 40	77.3	4	248	-525,148	3	71	46,812.9	0	0	0.0	0	0
40 - 45	87.0	3	234	-590,792	4	102	52,664.5	0	0	0.0	0	0
45 - 50	96.6	3	226	-656,436	2	50	58,516.1	0	0	0.0	0	0
50 - 55	106.3	3	171	-722,079	0	0	64,367.8	0	0	0.0	0	0
55 - 60	116.0	3	172	-787,723	0	0	70,219.4	0	0	0.0	0	0
60 - 65	125.6	1	86	-853,366	0	0	76,071.0	0	0	0.0	0	0
65 - 70	135.3	3	212	-919,010	0	0	81,922.6	0	0	0.0	0	0
70 - 75	145.0	1	85	-984,653	0	0	87,774.2	0	0	0.0	0	0
75 - 80	154.6	1	65	-1,050,297	0	0	93,625.8	0	0	0.0	0	0
80 - 85	164.3	1	86	-1,115,941	0	0	99,477.4	0	0	0.0	0	0
85 - 90	173.9	0	0	-1,181,584	0	0	105,329.0	0	0	0.0	0	0
90 - 95	183.6	0	0	-1,247,228	0	0	111,180.7	0	0	0.0	0	0
95 - 100	193.3	0	0	-1,312,871	0	0	117,032.3	100	8,760	0.0	0	0
Hours Off	0.0	0	1,967	0	0	6,418	0.0	0	0	0.0	0	8,760

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

### EXISTING WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

### EXISTING WATERSIDE EQUIPMENT

## EQUIPMENT ENERGY CONSUMPTION

[illegible]

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## EXISTING WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
27		BASE UTILITY												
	CHILLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28		BASE UTILITY												
	HOTLD	6	5	6	6	0	0	0	0	0	0	6	6	35
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29		BASE UTILITY												
	CHILLD	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
30		BASE UTILITY												
	HOTLD	12	11	12	12	0	0	0	0	0	0	12	12	70
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31		BASE UTILITY												
	CHILLD	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
32		BASE UTILITY												
	HOTLD	22	19	22	21	0	0	0	0	0	0	21	22	126
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 142 CHW Equipment														
1	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 123 CHW Equipment														
2	EQ1132L	WATER COOLED SELF CONTAINED > 15 TONS												
	ELEC	0	0	0	0	5575	6322	7273	7433	6087	1797	0	0	34,487
	PK	0.0	0.0	0.0	0.0	13.1	13.3	14.1	14.5	13.4	10.2	0.0	0.0	14.5

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## EXISTING WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	422	0	0	5,893
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	20	23	26	27	22	7	0	0	125
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
2	EQ5011	CONDENSER WATER PUMP-CV (MEDIUM EFFIC.)												
	ELEC	0	0	0	0	1637	1584	1637	1637	1584	1014	0	0	9,093
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
2	EQ5302	CONTROLS												
	ELEC	0	0	0	0	74	72	74	74	72	46	0	0	413
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
2	HUMIDIF	HUMIDIFIER												
	ELEC	0	0	0	0	680	644	720	661	684	608	0	0	3,997
	PK	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0	0.0	6.0
Bldg. 126 CHW Equipment														
3	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	12680	15777	19087	19207	13564	5886	0	0	86,201
	PK	0.0	0.0	0.0	0.0	40.4	43.8	47.1	47.9	43.3	35.0	0.0	0.0	47.9
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 131 CHW Equipment														
4	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	10394	12600	15078	15213	11078	5153	0	0	69,516
	PK	0.0	0.0	0.0	0.0	32.7	35.7	38.3	38.2	35.4	27.8	0.0	0.0	38.3
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldg. 129 CHW Equipment														
5	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	2292	2222	2115	2202	2297	2222	0	0	13,350
	PK	0.0	0.0	0.0	0.0	4.9	5.2	5.7	5.9	5.6	4.9	0.0	0.0	5.9
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
6	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	10152	12916	15948	15888	11122	6240	0	0	72,266
	PK	0.0	0.0	0.0	0.0	36.7	39.3	42.8	44.3	42.0	37.1	0.0	0.0	44.3
6	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1107	1428	1771	1726	1214	621	0	0	7,866
	PK	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	2.4
6	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	465	600	744	725	510	261	0	0	3,305
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 151 CHW Equipment														
7	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	75	305	738	1001	1254	1256	826	181	48	0	5,685
	PK	3.6	3.6	3.6	3.7	4.0	4.1	4.3	4.2	4.0	3.7	3.6	3.6	4.3
7	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	9	40	93	126	173	158	105	24	6	0	733
	PK	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.4	0.3	0.2	0.1	0.5
7	EQ5308	CONTROLS												
	ELEC	0	0	11	32	74	72	74	74	72	17	7	0	434
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 154 CHW Equipment														
8	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	40	303	874	1281	1679	1744	1078	168	29	0	7,197
	PK	7.0	7.0	7.0	7.3	7.7	8.1	8.3	8.3	7.8	7.3	7.0	7.0	8.3
8	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	5	41	113	164	264	223	141	23	3	0	978
	PK	0.1	0.0	0.2	0.4	0.5	0.6	1.0	1.0	0.6	0.3	0.2	0.1	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
8	EQ5308	CONTROLS												
	ELEC	0	0	5	20	54	72	74	74	63	13	4	0	379
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Bldg. 156 CHW Equipment													
9	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	0	238	845	1285	1721	1781	1074	110	0	0	7,055
	PK	0.0	0.0	13.1	13.8	14.6	15.2	15.8	15.7	14.7	13.7	13.1	0.0	15.8
9	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	0	30	104	156	333	215	133	14	0	0	986
	PK	0.0	0.0	0.2	0.3	0.5	0.5	1.8	1.8	0.5	0.3	0.2	0.0	1.8
9	EQ5308	CONTROLS												
	ELEC	0	0	0	18	49	72	74	74	60	11	0	0	358
	PK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
	Bldg. 157 CHW Equipment													
10	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	31	18	221	427	831	1027	1211	1208	842	357	161	24	6,357
	PK	3.1	3.1	3.1	3.3	3.5	3.6	3.8	3.7	3.5	3.3	3.1	3.1	3.8
10	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	3	2	26	60	113	142	178	167	118	47	19	2	876
	PK	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.1	0.5
10	EQ5308	CONTROLS												
	ELEC	6	4	20	47	74	72	74	74	72	52	15	2	514
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Bldg. 159 CHW Equipment													
11	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	1646	1847	2143	2097	1674	1068	0	0	10,476
	PK	0.0	0.0	0.0	0.0	3.6	3.7	3.8	3.8	3.4	2.3	0.0	0.0	3.8
11	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	232	269	316	308	246	130	0	0	1,501
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.4	0.0	0.0	0.5
11	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	EQ5313	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldg. 152 CHW Equipment														
12	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	92	687	2330	3262	4250	4300	2707	675	101	0	18,405
	PK	11.9	11.9	11.9	12.4	13.2	13.8	14.3	14.1	13.2	12.4	11.9	11.9	14.3
12	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	13	104	338	471	670	619	397	90	13	0	2,716
	PK	0.3	0.3	0.8	1.2	1.6	1.8	1.9	1.9	1.7	1.2	0.8	0.4	1.9
12	EQ5308	CONTROLS												
	ELEC	0	0	9	26	74	72	74	74	72	74	8	0	484
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 155 CHW Equipment														
13	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	360	262	892	1301	2662	3575	4321	4056	3024	945	638	299	22,335
	PK	8.2	8.3	6.6	6.4	8.1	10.0	9.9	9.3	9.0	7.8	7.8	8.3	10.0
13	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	24	16	77	139	275	370	487	423	318	98	56	21	2,305
	PK	0.6	0.4	0.7	0.7	0.8	1.0	1.0	1.0	0.9	0.8	0.7	0.5	1.0
13	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	47	43	114	202	399	403	417	417	403	138	94	43	2,719
	PK	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
13	EQ5313	CONTROLS												
	ELEC	25	23	61	108	214	216	223	223	216	74	50	23	1,457
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	249	218	759	1348	2044	2323	2622	2928	1869	1096	603	235	16,295
	PK	14.2	14.2	14.2	14.9	15.8	16.5	17.1	17.0	15.9	14.9	14.2	14.2	17.1
14	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	20	16	81	173	257	293	401	364	239	135	65	20	2,065
	PK	0.6	0.5	1.1	1.4	1.6	1.7	2.0	2.0	1.7	1.3	1.1	0.6	2.0
14	EQ5308	CONTROLS												
	ELEC	4	4	11	18	24	25	28	31	20	15	9	4	193
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 158 CHW Equipment														
15	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	235	896	2237	3069	3846	3844	2466	621	158	0	17,371
	PK	9.5	9.5	9.5	9.9	10.6	11.0	11.4	11.3	10.6	9.9	9.5	9.5	11.4

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 152 fans														
11	TYPFAN	GENERIC FAN												
	ELEC	3734	3373	3734	3614	3734	3614	3734	3734	3614	3734	3614	3734	43,967
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Bldg. 155 fans														
12	TYPFAN	GENERIC FAN												
	ELEC	8017	7241	8017	7758	8017	7758	8017	8017	7758	8017	7758	8017	94,395
	PK	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Bldg. 158 fans														
13	TYPFAN	GENERIC FAN												
	ELEC	4120	3722	4120	3988	4120	3988	4120	4120	3988	4120	3988	4120	48,515
	PK	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Bldg. 141 fans														
14	TYPFAN	GENERIC FAN												
	ELEC	1898	1714	1898	1836	1898	1836	1898	1898	1836	1898	1836	1898	22,342
	PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bldg. 260 fans														
15	TYPFAN	GENERIC FAN												
	ELEC	521	470	521	504	521	504	521	521	504	521	504	521	6,132
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Bldg. 261 fans														
16	TYPFAN	GENERIC FAN												
	ELEC	521	470	521	504	521	504	521	521	504	521	504	521	6,132
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Bldg. 268 fans														
17	TYPFAN	GENERIC FAN												
	ELEC	4687	4234	4687	4536	4687	4536	4687	4687	4536	4687	4536	4687	55,188
	PK	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Bldg. 142 HW Equipment														
1	WATERTUBE BOILER													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HEATING WATER CIRCULATION PUMP														
1	EQ5020													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BOILER CONTROLS														
1	EQ5311													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 123 HW Equipment														
2	EQ2201	GAS FIRED UNIT HEATER												
	GAS	118	115	29	28	0	0	0	0	0	0	28	109	426
	PK	0.7	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.8

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5250	UNIT HEATER FAN												
	ELEC	75	69	62	60	0	0	0	0	0	0	60	75	403
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
		Bldg. 126 HW Equipment												
3		WATERTUBE BOILER												
	GAS	250	238	66	56	0	0	0	0	0	0	81	246	937
	PK	1.4	1.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.4	1.5
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	273	258	195	180	0	0	0	0	0	0	199	274	1,379
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
3	EQ5311	BOILER CONTROLS												
	ELEC	46	43	33	30	0	0	0	0	0	0	33	46	230
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 131 HW Equipment												
4		WATERTUBE BOILER												
	GAS	268	255	63	51	0	0	0	0	0	0	78	264	979
	PK	1.3	1.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	1.4
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
4	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
		Bldg. 129 HW Equipment												
5		WATERTUBE BOILER												
	GAS	98	95	41	39	0	0	0	0	0	0	39	87	399
	PK	1.0	1.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	1.1
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1771	1599	1771	1714	0	0	0	0	0	0	1714	1771	10,339
	PK	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4
5	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

### EXISTING WATERSIDE EQUIPMENT

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 151 HW Equipment														
6	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	817	808	143	127	0	0	0	0	0	0	180	791	2,866
	PK	3.4	3.6	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.4	3.6
Bldg. 154 HW Equipment														
7	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	1753	1708	389	211	0	0	0	0	0	9	458	1676	6,203
	PK	5.4	5.8	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.7	2.8	5.5	5.8
Bldg. 156 HW Equipment														
8		WATERTUBE BOILER												
	GAS	95	93	19	10	0	0	0	0	0	0	22	91	330
	PK	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	107	100	55	46	0	0	0	0	0	0	59	108	475
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
8	EQ5311	BOILER CONTROLS												
	ELEC	70	66	37	30	0	0	0	0	0	0	39	71	313
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 157 HW Equipment														
9	EQ2201	GAS FIRED UNIT HEATER												
	GAS	36	35	8	8	0	0	0	0	0	0	8	37	131
	PK	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
9	EQ5250	UNIT HEATER FAN												
	ELEC	15	13	15	14	0	0	0	0	0	0	14	15	87
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 159 HW Equipment														
10	EQ2201	GAS FIRED UNIT HEATER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	EQ5250	UNIT HEATER FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 152 HW Equipment														
11	EQ2201	GAS FIRED UNIT HEATER												
	GAS	247	244	64	28	0	0	0	0	0	0	69	241	892
	PK	0.7	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.8
11	EQ5250	UNIT HEATER FAN												
	ELEC	103	93	103	99	0	0	0	0	0	0	99	103	599
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

### EXISTING WATERSIDE EQUIPMENT

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Num	Code	Monthly Consumption												Total	
				Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
Bldg. 155 HW Equipment																	
12	WATERTUBE BOILER																
	GAS		91	82	20	20	0	0	0	0	0	0	20	88	320		
	PK		0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.6		
12	EQ5020	HEATING WATER CIRCULATION PUMP															
	ELEC		417	376	417	403	0	0	0	0	0	0	403	417	2,433		
	PK		0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6		
12	EQ5311	BOILER CONTROLS															
	ELEC		93	84	93	90	0	0	0	0	0	0	90	93	543		
	PK		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1		
Bldg. 158 HW Equipment																	
13	EQ2201	GAS FIRED UNIT HEATER															
	GAS		158	155	30	21	0	0	0	0	0	0	38	154	556		
	PK		0.6	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.6		
13	EQ5250	UNIT HEATER FAN															
	ELEC		101	91	71	64	0	0	0	0	0	0	71	102	500		
	PK		0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2		
Bldg. 141 HW Equipment																	
14	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN															
	ELEC		1214	1172	275	169	0	0	0	0	0	0	309	1157	4,295		
	PK		3.7	3.7	2.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.7	3.7		
Bldgs. 260 & 261 HW Equipment																	
15	WATERTUBE BOILER																
	GAS		69	64	17	16	0	0	0	0	0	0	18	67	250		
	PK		0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4		
15	EQ5020	HEATING WATER CIRCULATION PUMP															
	ELEC		275	249	275	266	0	0	0	0	0	0	266	275	1,607		
	PK		0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4		
15	EQ5311	BOILER CONTROLS															
	ELEC		93	84	93	90	0	0	0	0	0	0	90	93	543		
	PK		0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1		
15	EQ5020	HEATING WATER CIRCULATION PUMP															
	ELEC		275	249	275	266	0	0	0	0	0	0	266	275	1,607		
	PK		0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4		
Bldg. 268 HW Equipment																	
16	WATERTUBE BOILER																
	GAS		233	221	59	27	0	0	0	0	0	0	65	223	827		
	PK		0.7	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.8		

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## EXISTING WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
16	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
16	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



```
*****
*****
**                                     **
**          T R A C E    6 0 0    A N A L Y S I S          **
**                                     **
**          by  HUITT & ZOLLARS                               **
**                                     **
*****
*****
```

030185.06 EEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON, TEXAS  
CORPS. OF ENGINEERS - FORT WORTH, TX.  
HUITT-ZOLLARS INC.  
AREA 100

## Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 14:39:23 2/22/96  
Dataset Name: FSH100A .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
ECO A-INSTALL EMS AIRSIDE SYS.

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	25.9	24	1,018	-160,080	69	775	13,765.7	0	0	0.0	0	0
5 - 10	51.8	16	703	-320,159	13	144	27,531.5	8	683	0.0	0	0
10 - 15	77.7	4	165	-480,239	7	78	41,297.2	1	96	0.0	0	0
15 - 20	103.5	5	201	-640,319	3	35	55,062.9	0	4	0.0	0	0
20 - 25	129.4	4	176	-800,398	2	18	68,828.7	0	0	0.0	0	0
25 - 30	155.3	18	753	-960,478	0	0	82,594.4	0	0	0.0	0	0
30 - 35	181.2	2	77	-1,120,558	1	14	96,360.1	56	4,867	0.0	0	0
35 - 40	207.1	2	104	-1,280,637	1	6	110,125.9	0	27	0.0	0	0
40 - 45	233.0	1	50	-1,440,717	1	6	123,891.6	0	27	0.0	0	0
45 - 50	258.9	3	149	-1,600,797	1	14	137,657.4	1	58	0.0	0	0
50 - 55	284.7	4	179	-1,760,876	1	9	151,423.1	0	21	0.0	0	0
55 - 60	310.6	6	269	-1,920,956	2	20	165,188.8	0	5	0.0	0	0
60 - 65	336.5	9	392	-2,081,035	0	3	178,954.5	0	0	0.0	0	0
65 - 70	362.4	1	34	-2,241,115	0	0	192,720.3	0	0	0.0	0	0
70 - 75	388.3	0	0	-2,401,195	0	0	206,486.0	32	2,828	0.0	0	0
75 - 80	414.2	0	0	-2,561,274	0	0	220,251.7	0	0	0.0	0	0
80 - 85	440.1	0	0	-2,721,355	0	0	234,017.5	0	0	0.0	0	0
85 - 90	465.9	0	0	-2,881,433	0	0	247,783.2	0	42	0.0	0	0
90 - 95	491.8	0	0	-3,041,514	0	0	261,549.0	0	0	0.0	0	0
95 - 100	517.7	0	0	-3,201,593	0	0	275,314.7	1	102	0.0	0	0
Hours Off	0.0	0	4,490	0	0	7,638	0.0	0	0	0.0	0	8,760

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO A-INSTALL EMS WATERSIDE SYS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	74860	67694	79738	71659	77299	76537	72421	79738	71659	77299	71659	72421	892,986
	PK	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8	434.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	945	914	945	945	914	945	0	0	5,608
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
2		BASE UTILITY												
	HOTLD	55	49	55	53	0	0	0	0	0	0	53	55	319
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3		BASE UTILITY												
	CHILLD	0	0	0	0	982	950	982	982	950	982	0	0	5,829
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
4		BASE UTILITY												
	HOTLD	55	49	55	53	0	0	0	0	0	0	53	55	320
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5		BASE UTILITY												
	CHILLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6		BASE UTILITY												
	HOTLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7		BASE UTILITY												
	CHILLD	0	0	0	0	618	598	618	618	598	618	0	0	3,665
	PK	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.8
8		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	263
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
9		BASE UTILITY												
	CHILLD	0	0	0	0	662	641	662	662	641	662	0	0	3,930
	PK	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.9
10		BASE UTILITY												
	HOTLD	33	30	33	32	0	0	0	0	0	0	32	33	195
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11		BASE UTILITY												
	CHILLD	0	0	0	0	967	936	967	967	936	967	0	0	5,741
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
12		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
13		BASE UTILITY												
	CHILLD	0	0	0	0	967	936	967	967	936	967	0	0	5,741
	PK	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	1.3
14		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
15		BASE UTILITY												
	CHILLD	0	0	0	0	1034	1001	1034	1034	1001	1034	0	0	6,138
	PK	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	1.4

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO A-INSTALL EMS WATERSIDE SYS

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
16		BASE UTILITY												
	HOTLD	53	48	53	51	0	0	0	0	0	0	51	53	308
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
17		BASE UTILITY												
	CHILLD	0	0	0	0	729	706	729	729	706	729	0	0	4,328
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
18		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
19		BASE UTILITY												
	CHILLD	0	0	0	0	1473	1426	1473	1473	1426	1473	0	0	8,744
	PK	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	2.0
20		BASE UTILITY												
	HOTLD	37	34	37	36	0	0	0	0	0	0	36	37	217
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
21		BASE UTILITY												
	HOTLD	37	34	37	36	0	0	0	0	0	0	36	37	217
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
22		BASE UTILITY												
	CHILLD	0	0	0	0	774	749	774	774	749	774	0	0	4,593
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
23		BASE UTILITY												
	HOTLD	41	37	41	39	0	0	0	0	0	0	39	41	237
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
24		BASE UTILITY												
	CHILLD	0	0	0	0	394	382	394	394	382	394	0	0	2,340
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5
25		BASE UTILITY												
	HOTLD	15	13	15	14	0	0	0	0	0	0	14	15	85
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26		BASE UTILITY												
	CHILLD	0	0	0	0	536	518	536	536	518	536	0	0	3,180
	PK	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.7

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO A-INSTALL EMS WATERSIDE SYS

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
27		BASE UTILITY												
	HOTLD	26	24	26	26	0	0	0	0	0	0	26	26	154
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28		BASE UTILITY												
	CHILLD	0	0	0	0	82	79	82	82	79	82	0	0	486
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
29		BASE UTILITY												
	HOTLD	6	6	6	6	0	0	0	0	0	0	6	6	37
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30		BASE UTILITY												
	CHILLD	0	0	0	0	2232	2160	2232	2232	2160	2232	0	0	13,248
	PK	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0	3.0
31		BASE UTILITY												
	HOTLD	92	83	92	89	0	0	0	0	0	0	89	92	535
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldgs. 122 & 140 CHW Equipment														
1	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	11500	13118	14970	15991	11521	6423	0	0	73,523
	PK	0.0	0.0	0.0	0.0	59.1	61.8	64.1	63.6	59.4	51.6	0.0	0.0	64.1
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
Bldgs. 124 & 125 CHW Equipment														
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	12439	14389	16385	17255	12399	6791	0	0	79,658
	PK	0.0	0.0	0.0	0.0	62.4	65.7	68.5	67.9	62.8	51.7	0.0	0.0	68.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
Bldg. 128 CHW Equipment														
3	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 133 CHW Equipment														
4	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	7553	8519	9632	10320	7726	3784	0	0	47,534
	PK	0.0	0.0	0.0	0.0	37.9	43.2	44.8	44.4	41.5	36.1	0.0	0.0	44.8
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldgs 134 & 135 CHW Equipment														
5	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	14311	14275	16792	18510	13965	9015	0	0	86,869
	PK	0.0	0.0	0.0	0.0	49.6	51.8	53.8	53.3	49.8	45.9	0.0	0.0	53.8
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	275	266	275	275	266	275	0	0	1,634
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldg. 143 CHW Equipment														
6	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	13098	14039	15614	17327	12826	8167	0	0	81,071
	PK	0.0	0.0	0.0	0.0	62.2	65.0	67.4	66.8	62.4	54.3	0.0	0.0	67.4
6	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
6	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 144 CHW Equipment														
7	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	826	887	984	1100	804	580	0	0	5,181
	PK	0.0	0.0	0.0	0.0	4.3	4.5	4.6	4.6	4.3	3.7	0.0	0.0	4.6
7	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	564	556	569	620	529	517	0	0	3,356
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
7	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	252	248	254	277	236	231	0	0	1,498
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
8	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	10454	11381	12734	14359	10241	5748	0	0	64,917
	PK	0.0	0.0	0.0	0.0	56.5	59.1	61.2	60.7	56.7	49.3	0.0	0.0	61.2
8	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	564	556	569	620	529	437	0	0	3,275
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
8	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	252	248	254	277	236	195	0	0	1,462
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 145 CHW Equipment														
9	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	0	0	5359	6687	7872	8328	5645	2914	0	0	36,804
	PK	0.0	0.0	0.0	0.0	51.9	54.0	56.0	55.5	52.0	48.6	0.0	0.0	56.0
9	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	0	0	756	950	1522	1176	811	392	0	0	5,607
	PK	0.0	0.0	0.0	0.0	4.8	5.5	7.4	7.4	5.2	3.8	0.0	0.0	7.4



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
9	EQ5308	CONTROLS												
	ELEC	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
		Bldg. 146 CHW Equipment												
10	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	12695	13543	15069	16641	12387	7892	0	0	78,227
	PK	0.0	0.0	0.0	0.0	60.3	63.0	65.3	64.8	60.5	52.6	0.0	0.0	65.3
10	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
10	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldgs. 147 & 149 CHW Equipment												
11	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	19696	23601	27149	26932	20942	9924	0	0	128,244
	PK	0.0	0.0	0.0	0.0	81.0	86.4	89.6	88.9	82.6	75.1	0.0	0.0	89.6
11	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2775	2686	2775	2775	2686	2775	0	0	16,472
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
11	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldg. 197 CHW Equipment												
12	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	13599	14193	15511	16829	13043	8055	0	0	81,229
	PK	0.0	0.0	0.0	0.0	59.3	62.0	64.2	63.7	59.5	51.7	0.0	0.0	64.2
12	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
12	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldg. 198 CHW Equipment												
13	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	2940	3176	3629	4003	2921	1648	0	0	18,317
	PK	0.0	0.0	0.0	0.0	13.5	14.1	14.7	14.5	13.6	11.8	0.0	0.0	14.7

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
13	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	373	420	560	534	388	183	0	0	2,457
	PK	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.5	0.0	0.0	1.8
13	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	833	806	833	833	806	833	0	0	4,946
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
13	EQ5313	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
Bldg. 199 CHW Equipment														
14	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	4999	5585	6319	6922	5138	3100	0	0	32,063
	PK	0.0	0.0	0.0	0.0	24.8	25.9	26.9	26.7	24.9	21.6	0.0	0.0	26.9
14	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
14	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 127 CHW Equipment														
15	EQ1161	AIR COOLED COND COMP < 15 TONS												
	ELEC	0	0	0	0	1234	1417	1695	1830	1213	644	0	0	8,033
	PK	0.0	0.0	0.0	0.0	6.6	6.9	7.1	7.1	6.6	6.1	0.0	0.0	7.1
15	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	109	131	185	171	112	52	0	0	760
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.4	0.0	0.0	0.6
15	EQ5303	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
Bldg. 250 CHW Equipment														
16	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	37250	43641	51157	51906	39605	20629	0	0	244,189
	PK	0.0	0.0	0.0	0.0	142.6	149.5	161.4	164.8	143.7	125.7	0.0	0.0	164.8
16	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	4166	4032	4166	4166	4032	4166	0	0	24,730
	PK	0.0	0.0	0.0	0.0	5.6	5.6	5.6	5.6	5.6	5.6	0.0	0.0	5.6

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO A-INSTALL EMS WATERSIDE SYS

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
16	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
		Bldg. 122 fans												
1	TYPFAN	GENERIC FAN												
	ELEC	1911	1722	2213	2099	2066	2034	1987	2128	1935	1919	2040	1861	23,915
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
		Bldg. 140 fans												
2	TYPFAN	GENERIC FAN												
	ELEC	175	156	195	179	176	175	181	196	165	164	175	169	2,105
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		Bldg. 124 fans												
3	TYPFAN	GENERIC FAN												
	ELEC	1911	1722	2226	2099	2066	2036	1987	2129	1935	1919	2032	1861	23,924
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
		Bldg. 125 fans												
4	TYPFAN	GENERIC FAN												
	ELEC	3569	3217	3952	3922	4198	4198	4044	4366	3927	4106	3665	3478	46,642
	PK	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
		Bldg. 128 fans												
5	TYPFAN	GENERIC FAN												
	ELEC	1747	1575	1935	1920	1881	1860	1813	1947	1770	1755	1770	1702	21,675
	PK	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
		Bldg. 133 fans												
6	TYPFAN	GENERIC FAN												
	ELEC	2189	1984	2306	2132	2066	2036	2096	2279	1935	1979	2099	2140	25,242
	PK	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
		Bldg. 134 fans												
7	TYPFAN	GENERIC FAN												
	ELEC	4479	4067	4720	4302	4235	4168	4096	4554	3966	4021	4302	4352	51,263
	PK	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
		Bldg. 135 fans												
8	TYPFAN	GENERIC FAN												
	ELEC	4479	4067	4720	4302	4235	4168	4096	4554	3966	4021	4302	4352	51,263
	PK	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
		Bldg. 143 fans												
9	TYPFAN	GENERIC FAN												
	ELEC	12188	11008	12188	11795	12188	11795	12188	12188	11795	12188	11795	12188	143,500
	PK	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4
		Bldg. 144 fans												
10	TYPFAN	GENERIC FAN												
	ELEC	4589	4176	4843	4426	4357	4288	4234	4680	4081	4137	4426	4469	52,706
	PK	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO A-INSTALL EMS WATERSIDE SYS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 145 fans														
11	TYPFAN	GENERIC FAN												
	ELEC	3255	2940	3255	3150	3255	3150	3255	3255	3150	3255	3150	3255	38,325
	PK	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Bldg. 146 fans														
12	TYPFAN	GENERIC FAN												
	ELEC	3255	2940	3255	3150	3255	3150	3255	3255	3150	3255	3150	3255	38,325
	PK	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Bldg. 147 fans														
13	TYPFAN	GENERIC FAN												
	ELEC	1778	1621	1883	1715	1688	1662	1704	1856	1581	1586	1715	1739	20,528
	PK	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Bldg. 149 fans														
14	TYPFAN	GENERIC FAN												
	ELEC	1312	1198	1397	1272	1253	1233	1189	1288	1173	1188	1272	1286	15,061
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Bldg. 197 fans														
15	TYPFAN	GENERIC FAN												
	ELEC	1660	1496	1946	1824	1795	1767	1714	1844	1681	1667	1790	1617	20,800
	PK	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Bldg. 198 fans														
16	TYPFAN	GENERIC FAN												
	ELEC	2381	2151	2381	2304	2381	2304	2381	2381	2304	2381	2304	2381	28,035
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Bldg. 199 fans														
17	TYPFAN	GENERIC FAN												
	ELEC	553	497	618	563	554	549	536	574	519	515	557	536	6,571
	PK	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Bldg. 127 fans														
18	TYPFAN	GENERIC FAN												
	ELEC	804	724	900	820	807	799	780	835	756	749	810	781	9,563
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Bldg. 250 fans														
19	TYPFAN	GENERIC FAN												
	ELEC	1473	1338	1574	1450	1411	1390	1434	1558	1322	1401	1434	1445	17,230
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Bldgs. 122 & 140 HW Equipment														
1		WATERTUBE BOILER												
	GAS	228	231	92	73	0	0	0	0	0	0	94	222	938
	PK	3.6	3.6	1.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.6	3.6

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	472	428	426	403	0	0	0	0	0	0	416	470	2,614
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
1	EQ5311	BOILER CONTROLS												
	ELEC	53	48	48	45	0	0	0	0	0	0	46	53	292
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
Bldgs. 124 & 125 HW Equipment														
2		WATERTUBE BOILER												
	GAS	216	218	89	73	0	0	0	0	0	0	93	211	898
	PK	3.1	3.1	1.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.1	3.1
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	472	428	426	403	0	0	0	0	0	0	416	470	2,614
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
2	EQ5311	BOILER CONTROLS												
	ELEC	53	48	48	45	0	0	0	0	0	0	46	53	292
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
Bldg. 128 HW Equipment														
3		WATERTUBE BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 133 HW Equipment														
4		WATERTUBE BOILER												
	GAS	208	205	77	60	0	0	0	0	0	0	81	207	838
	PK	1.5	1.5	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	275	249	275	266	0	0	0	0	0	0	266	275	1,607
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
4	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
4	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	2775	2507	2775	2686	0	0	0	0	0	0	2686	2775	16,203
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
Bldgs 134 & 135 HW Equipment														
5		WATERTUBE BOILER												
	GAS	62	55	46	45	0	0	0	0	0	0	45	60	313
	PK	1.3	1.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.3
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	98	88	92	89	0	0	0	0	0	0	89	98	554
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
5	EQ5311	BOILER CONTROLS												
	ELEC	33	30	31	30	0	0	0	0	0	0	30	33	187
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 143 HW Equipment														
6		WATERTUBE BOILER												
	GAS	117	124	66	60	0	0	0	0	0	0	62	104	533
	PK	2.6	2.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8	2.9
6	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	294	272	282	270	0	0	0	0	0	0	270	295	1,683
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
6	EQ5311	BOILER CONTROLS												
	ELEC	49	45	47	45	0	0	0	0	0	0	45	49	281
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 144 HW Equipment														
7		WATERTUBE BOILER												
	GAS	117	124	66	60	0	0	0	0	0	0	62	104	533
	PK	2.6	2.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8	2.9
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	294	272	282	270	0	0	0	0	0	0	270	295	1,683
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
7	EQ5311	BOILER CONTROLS												
	ELEC	49	45	47	45	0	0	0	0	0	0	45	49	281
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 145 HW Equipment												
8	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	1638	1677	635	532	0	0	0	0	0	0	603	1381	6,465
	PK	21.9	21.9	21.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	19.4	21.9	21.9
		Bldg. 146 HW Equipment												
9		WATERTUBE BOILER												
	GAS	124	130	62	60	0	0	0	0	0	0	60	106	543
	PK	2.9	2.9	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.9	2.9
9	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	287	264	279	270	0	0	0	0	0	0	270	286	1,655
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
9	EQ5311	BOILER CONTROLS												
	ELEC	48	44	47	45	0	0	0	0	0	0	45	48	276
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 147 HW Equipment												
10		WATERTUBE BOILER												
	GAS	114	110	51	50	0	0	0	0	0	0	50	90	465
	PK	1.3	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.4
10	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	238	199	186	180	0	0	0	0	0	0	180	209	1,192
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
10	EQ5311	BOILER CONTROLS												
	ELEC	40	33	31	30	0	0	0	0	0	0	30	35	199
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 149 HW Equipment												
11		WATERTUBE BOILER												
	GAS	114	110	51	50	0	0	0	0	0	0	50	90	465
	PK	1.3	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.4
11	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	238	199	186	180	0	0	0	0	0	0	180	209	1,192
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
11	EQ5311	BOILER CONTROLS												
	ELEC	40	33	31	30	0	0	0	0	0	0	30	35	199
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO A-INSTALL EMS WATERSIDE SYS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 197 HW Equipment														
12	WATERTUBE BOILER													
	GAS	108	104	46	45	0	0	0	0	0	0	45	94	443
	PK	2.7	2.7	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.6	2.7
12	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	111	102	93	90	0	0	0	0	0	0	90	109	595
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
12	EQ5311	BOILER CONTROLS												
	ELEC	19	17	15	15	0	0	0	0	0	0	15	18	99
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 198 HW Equipment														
13	WATERTUBE BOILER													
	GAS	39	37	20	19	0	0	0	0	0	0	19	36	171
	PK	0.9	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.9
13	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	115	106	104	101	0	0	0	0	0	0	101	114	641
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
13	EQ5311	BOILER CONTROLS												
	ELEC	26	24	23	23	0	0	0	0	0	0	23	25	143
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 199 HW Equipment														
14	WATERTUBE BOILER													
	GAS	108	109	45	35	0	0	0	0	0	0	46	109	452
	PK	1.6	1.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.6	1.6
14	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	833	753	833	806	0	0	0	0	0	0	806	833	4,865
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
14	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 127 HW Equipment														
15	EQ2454	RESIDENTIAL GAS FURNACE WITH FAN												
	GAS	21	19	9	8	0	0	0	0	0	0	9	21	86
	PK	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4
15	EQ5254	RESIDENTIAL FURNACE FAN												
	ELEC	540	488	540	523	0	0	0	0	0	0	523	540	3,154
	PK	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
 ECO A-INSTALL EMS WATERSIDE SYS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 250 HW Equipment														
16		STEAM BOILER												
	GAS	153	138	126	122	0	0	0	0	0	0	122	134	795
	PK	1.7	1.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.7
16	EQ5311	BOILER CONTROLS												
	ELEC	49	45	47	45	0	0	0	0	0	0	45	47	278
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

```
*****
*****
**
**          T R A C E    6 0 0    A N A L Y S I S          **
**
**          by  HUITT & ZOLLARS                          **
**
*****
*****
```

030185.06 BEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON, TEXAS  
CORPS. OF ENGINEERS - FORT WORTH, TX.  
HUITT-ZOLLARS INC.  
AREA 100

## Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 18: 7:13 2/22/96  
Dataset Name: FSH100B .TM

## SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2

ECO A-INSTALL EMS AIRSIDE EQ

## ----- SYSTEM LOAD PROFILE -----

## System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	9.7	41	2,513	-65,644	50	810	5,851.6	0	0	0.0	0	0
5 - 10	19.3	23	1,415	-131,287	25	397	11,703.2	0	0	0.0	0	0
10 - 15	29.0	9	533	-196,931	14	219	17,554.8	0	0	0.0	0	0
15 - 20	38.7	2	153	-262,574	1	16	23,406.5	0	0	0.0	0	0
20 - 25	48.3	2	119	-328,218	4	58	29,258.1	0	0	0.0	0	0
25 - 30	58.0	1	54	-393,861	1	23	35,109.7	0	0	0.0	0	0
30 - 35	67.6	1	64	-459,505	1	20	40,961.3	63	5,553	0.0	0	0
35 - 40	77.3	1	90	-525,148	1	10	46,812.9	1	86	0.0	0	0
40 - 45	87.0	1	78	-590,792	0	5	52,664.5	0	36	0.0	0	0
45 - 50	96.6	1	67	-656,436	0	0	58,516.1	1	79	0.0	0	0
50 - 55	106.3	1	74	-722,079	1	17	64,367.8	0	17	0.0	0	0
55 - 60	116.0	1	78	-787,723	0	0	70,219.4	0	4	0.0	0	0
60 - 65	125.6	6	347	-853,366	1	11	76,071.0	0	16	0.0	0	0
65 - 70	135.3	2	138	-919,010	1	9	81,922.6	0	5	0.0	0	0
70 - 75	145.0	2	144	-984,653	0	0	87,774.2	0	17	0.0	0	0
75 - 80	154.6	1	68	-1,050,297	1	10	93,625.8	0	33	0.0	0	0
80 - 85	164.3	2	145	-1,115,941	0	0	99,477.4	1	66	0.0	0	0
85 - 90	173.9	2	120	-1,181,584	0	0	105,329.0	0	23	0.0	0	0
90 - 95	183.6	0	0	-1,247,228	0	0	111,180.7	0	3	0.0	0	0
95 - 100	193.3	0	0	-1,312,871	0	0	117,032.3	32	2,822	0.0	0	0
Hours Off	0.0	0	2,560	0	0	7,155	0.0	0	0	0.0	0	8,760

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
27		BASE UTILITY												
	CHILLD	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28		BASE UTILITY												
	HOTLD	6	5	6	6	0	0	0	0	0	0	6	6	35
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29		BASE UTILITY												
	CHILLD	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
30		BASE UTILITY												
	HOTLD	12	11	12	12	0	0	0	0	0	0	12	12	70
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31		BASE UTILITY												
	CHILLD	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
32		BASE UTILITY												
	HOTLD	22	19	22	21	0	0	0	0	0	0	21	22	126
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 142 CHW Equipment														
1	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5313	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 123 CHW Equipment														
2	EQ1132L	WATER COOLED SELF CONTAINED > 15 TONS												
	ELEC	0	0	404	3663	5575	6322	7273	7433	6087	1094	1043	0	38,895
	PK	9.2	9.2	9.3	11.0	12.5	13.3	14.1	14.5	13.4	10.2	9.4	9.2	14.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	55	848	1109	1073	1109	1109	1073	278	128	0	6,780
	PK	0.1	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.3	1.5
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	2	14	20	23	26	27	22	4	4	0	142
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
2	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	136	1456	1637	1584	1637	1637	1584	719	431	0	10,822
	PK	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
2	EQ5302	CONTROLS												
	ELEC	0	0	6	66	74	72	74	74	72	33	20	0	492
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	HUMIDIF	HUMIDIFIER												
	ELEC	0	0	220	684	680	644	720	661	684	567	619	0	5,480
	PK	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Bldg. 126 CHW Equipment														
3	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	9287	9990	11088	11898	9177	5915	0	0	57,356
	PK	0.0	0.0	0.0	0.0	45.1	47.2	48.9	48.5	45.3	39.4	0.0	0.0	48.9
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1109	1073	1109	1109	1073	1109	0	0	6,580
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 131 CHW Equipment														
4	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	7593	8267	9508	10228	7561	4942	0	0	48,099
	PK	0.0	0.0	0.0	0.0	35.5	37.1	38.5	38.2	35.7	31.0	0.0	0.0	38.5
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1667	1613	1667	1667	1613	1667	0	0	9,892
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	2.2
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0



## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO A-INSTALL EMS WATERSIDE EQ

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 129 CHW Equipment														
5	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	2486	2527	2810	2899	2508	2235	0	0	15,466
	PK	0.0	0.0	0.0	0.0	5.6	5.8	6.0	6.0	5.6	4.9	0.0	0.0	6.0
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
6	ACC1	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	7839	8223	9382	10201	8093	5575	0	0	49,313
	PK	0.0	0.0	0.0	0.0	42.0	43.9	45.5	45.1	42.2	37.1	0.0	0.0	45.5
6	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	600	590	581	624	562	521	0	0	3,477
	PK	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4	0.0	0.0	2.4
6	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	252	248	244	262	236	219	0	0	1,461
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 151 CHW Equipment														
7	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	62	232	482	665	884	874	543	157	43	0	3,942
	PK	3.6	3.6	3.6	3.7	4.0	4.1	4.3	4.2	4.0	3.7	3.6	3.6	4.3
7	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	7	30	60	84	125	110	69	20	5	0	512
	PK	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.5
7	EQ5308	CONTROLS												
	ELEC	0	0	6	15	28	37	52	45	31	13	5	0	233
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 154 CHW Equipment														
8	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	26	252	537	770	1101	1141	653	139	19	0	4,639
	PK	7.0	7.0	7.0	7.3	7.7	8.1	8.3	8.3	7.8	7.3	7.0	7.0	8.3
8	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	3	34	69	99	182	146	85	19	2	0	639
	PK	0.1	0.0	0.2	0.4	0.5	0.6	1.0	1.0	0.6	0.3	0.2	0.1	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
8	EQ5308	CONTROLS												
	ELEC	0	0	2	12	22	30	47	43	25	8	2	0	193
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Bldg. 156 CHW Equipment												
9	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	0	195	493	741	1092	1125	623	84	0	0	4,352
	PK	0.0	0.0	13.1	13.8	14.6	15.2	15.8	15.7	14.7	13.7	13.1	0.0	15.8
9	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	0	25	60	90	233	136	76	11	0	0	631
	PK	0.0	0.0	0.2	0.3	0.5	0.6	1.8	1.8	0.6	0.3	0.2	0.0	1.8
9	EQ5308	CONTROLS												
	ELEC	0	0	0	12	22	29	45	40	25	6	0	0	178
	PK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
		Bldg. 157 CHW Equipment												
10	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	25	12	196	323	609	766	933	923	621	316	148	22	4,893
	PK	3.1	3.1	3.1	3.3	3.5	3.6	3.8	3.7	3.5	3.3	3.1	3.1	3.8
10	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	2	1	23	45	83	107	148	128	87	41	18	2	683
	PK	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.1	0.5
10	EQ5308	CONTROLS												
	ELEC	4	2	16	18	53	58	64	62	53	44	11	2	387
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Bldg. 159 CHW Equipment												
11	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	0	0	0	0	1646	1847	2143	2097	1674	1068	0	0	10,476
	PK	0.0	0.0	0.0	0.0	3.6	3.7	3.8	3.8	3.4	2.3	0.0	0.0	3.8
11	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	0	0	0	0	232	269	316	308	246	130	0	0	1,501
	PK	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.4	0.0	0.0	0.5
11	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	EQ5313	CONTROLS												
	ELEC	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 152 CHW Equipment														
12	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	78	353	1401	2070	2844	2827	1588	518	87	0	11,767
	PK	11.9	11.9	11.9	12.4	13.2	13.8	14.3	14.1	13.2	12.4	11.9	11.9	14.3
12	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	0	0	11	54	199	298	494	406	231	66	12	0	1,769
	PK	0.3	0.3	0.8	1.2	1.6	1.8	1.9	1.9	1.8	1.2	0.8	0.4	1.9
12	EQ5308	CONTROLS												
	ELEC	0	0	7	14	74	72	74	74	72	74	6	0	468
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 155 CHW Equipment														
13	EQ1113	AIR-CLD RECIPROCATING < 15 TONS												
	ELEC	468	407	949	1165	1786	2095	2126	2316	1884	911	683	535	15,325
	PK	7.7	8.3	7.6	7.7	8.7	9.6	9.4	9.4	8.8	7.6	7.8	8.4	9.6
13	EQ5203	CONDENSER FANS-AIR CLD CHILLER												
	ELEC	28	22	64	112	177	215	225	241	195	78	50	31	1,439
	PK	0.4	0.4	0.5	0.9	0.9	1.0	1.0	1.0	0.9	0.8	0.7	0.5	1.0
13	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	78	73	115	130	141	149	145	157	141	116	87	78	1,412
	PK	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
13	EQ5313	CONTROLS												
	ELEC	42	39	62	70	76	80	78	84	76	62	47	42	757
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Bldg. 158 CHW Equipment														
14	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	433	389	1139	1734	2753	3406	3503	3790	2917	1446	945	343	22,797
	PK	14.2	14.2	14.2	14.9	15.8	16.5	17.1	17.0	15.9	14.9	14.2	14.2	17.1
14	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	33	27	97	198	328	425	451	480	366	149	82	25	2,660
	PK	0.6	0.6	1.1	1.7	1.8	1.8	2.0	2.0	1.8	1.7	1.1	0.7	2.0
14	EQ5308	CONTROLS												
	ELEC	9	8	16	19	23	26	26	28	24	20	14	7	219
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bldg. 158 CHW Equipment														
15	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	0	0	189	682	1512	2098	2772	2757	1665	547	138	0	12,359
	PK	9.5	9.5	9.5	9.9	10.6	11.0	11.4	11.3	10.6	9.9	9.5	9.5	11.4

ECO A-INSTALL EMS WATERSIDE EO

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption													
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total	
15	EQ5215	CONDENSER FANS-HEAT PUMP													
	ELEC	0	0	22	89	188	266	397	347	212	69	16	0	1,606	
	PK	0.3	0.2	0.7	1.0	1.3	1.3	1.3	1.3	1.3	0.9	0.6	0.3	1.3	
15	EQ5308	CONTROLS													
	ELEC	0	0	7	14	49	54	65	61	50	42	4	0	345	
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Bldg. 141 CHW Equipment															
16	EQ1307	PACKAGED TERMINAL AIR CONDITIONER													
	ELEC	18	5	129	308	838	1078	1339	1342	880	453	92	7	6,489	
	PK	3.1	3.1	3.1	3.3	3.5	3.6	3.8	3.7	3.5	3.3	3.1	3.1	3.8	
16	EQ5215	CONDENSER FANS-HEAT PUMP													
	ELEC	2	0	16	44	114	150	189	185	123	56	11	1	890	
	PK	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.1	0.5	
16	EQ5308	CONTROLS													
	ELEC	2	2	11	19	74	72	74	74	72	74	8	2	486	
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Bldgs. 260 & 261 CHW Equipment															
17	ACC1	TYPICAL AIR COOLED RECIP CHILLER													
	ELEC	0	0	0	0	3586	4612	5734	5473	3459	1815	0	0	24,678	
	PK	0.0	0.0	0.0	0.0	18.3	19.9	21.1	20.9	18.3	17.3	0.0	0.0	21.1	
17	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME													
	ELEC	0	0	0	0	136	179	216	202	133	59	0	0	925	
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4	
17	EQ5300	CONTROL PANEL & INTERLOCKS													
	ELEC	0	0	0	0	368	484	584	546	359	159	0	0	2,500	
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0	
17	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME													
	ELEC	0	0	0	0	136	179	216	202	133	59	0	0	925	
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4	
Bldg. 268 CHW Equipment															
18	ACC1	TYPICAL AIR COOLED RECIP CHILLER													
	ELEC	655	535	2054	2842	4104	4580	4921	5396	4152	2389	1626	637	33,891	
	PK	11.3	12.3	14.0	19.0	20.9	22.8	23.6	23.4	21.9	19.0	17.5	14.2	23.6	
18	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME													
	ELEC	59	57	120	130	141	139	137	157	132	122	102	68	1,365	
	PK	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	

ECO A-INSTALL EMS WATERSIDE EQ

## EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
18	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	106	102	214	232	252	248	244	281	236	218	182	122	2,437
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Bldg. 142 fans												
1	TYPFAN	GENERIC FAN												
	ELEC	1242	1119	1388	1268	1376	1357	1308	1412	1288	1352	1263	1271	15,644
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		Bldg. 123 fans												
2	TYPFAN	GENERIC FAN												
	ELEC	1786	1613	1786	1728	1786	1728	1786	1786	1728	1786	1728	1786	21,024
	PK	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
		Bldg. 126 fans												
3	TYPFAN	GENERIC FAN												
	ELEC	905	787	1037	947	932	921	896	962	873	866	936	879	10,942
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
		Bldg. 131 fans												
4	TYPFAN	GENERIC FAN												
	ELEC	2743	2406	3142	2867	2822	2787	2711	2913	2643	2621	2833	2661	33,149
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
		Bldg. 129 fans												
5	TYPFAN	GENERIC FAN												
	ELEC	3465	3163	3765	3430	3377	3323	3223	3478	3162	3136	3430	3503	40,457
	PK	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4
		Bldg. 151 fans												
6	TYPFAN	GENERIC FAN												
	ELEC	1257	1135	1257	1216	1257	1216	1257	1257	1216	1257	1216	1257	14,795
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
		Bldg. 154 fans												
7	TYPFAN	GENERIC FAN												
	ELEC	1058	956	1058	1024	1058	1024	1058	1058	1024	1058	1024	1058	12,463
	PK	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
		Bldg. 156 fans												
8	TYPFAN	GENERIC FAN												
	ELEC	895	809	895	866	895	866	895	895	866	895	866	895	10,540
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		Bldg. 157 fans												
9	TYPFAN	GENERIC FAN												
	ELEC	1946	1758	1946	1883	1946	1883	1946	1946	1883	1946	1883	1946	22,914
	PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
		Bldg. 159 fans												
10	TYPFAN	GENERIC FAN												
	ELEC	1753	1584	1753	1697	1753	1697	1753	1753	1697	1753	1697	1753	20,644
	PK	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 152 fans														
11	TYPFAN	GENERIC FAN												
	ELEC	3734	3373	3734	3614	3734	3614	3734	3734	3614	3734	3614	3734	43,967
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Bldg. 155 fans														
12	TYPFAN	GENERIC FAN												
	ELEC	2495	2255	2625	2543	2715	2866	2759	2990	2640	2599	2371	2429	31,288
	PK	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Bldg. 158 fans														
13	TYPFAN	GENERIC FAN												
	ELEC	4120	3722	4120	3988	4120	3988	4120	4120	3988	4120	3988	4120	48,515
	PK	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Bldg. 141 fans														
14	TYPFAN	GENERIC FAN												
	ELEC	1898	1714	1898	1836	1898	1836	1898	1898	1836	1898	1836	1898	22,342
	PK	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Bldg. 260 fans														
15	TYPFAN	GENERIC FAN												
	ELEC	521	470	521	504	521	504	521	521	504	521	504	521	6,132
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Bldg. 261 fans														
16	TYPFAN	GENERIC FAN												
	ELEC	521	470	521	504	521	504	521	521	504	521	504	521	6,132
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Bldg. 268 fans														
17	TYPFAN	GENERIC FAN												
	ELEC	1468	1323	1572	1487	1588	1562	1520	1642	1487	1562	1399	1430	18,040
	PK	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Bldg. 142 HW Equipment														
1		WATERTUBE BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HEATING WATER CIRCULATION PUMP														
1	EQ5020													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BOILER CONTROLS														
1	EQ5311													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 123 HW Equipment														
2	EQ2201	GAS FIRED UNIT HEATER												
	GAS	109	110	29	63	0	0	0	0	0	0	47	106	464
	PK	1.5	1.5	0.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO A-INSTALL EMS WATERSIDE EQ

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5250	UNIT HEATER FAN												
	ELEC	72	65	62	60	0	0	0	0	0	0	64	70	395
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
		Bldg. 126 HW Equipment												
3		WATERTUBE BOILER												
	GAS	145	133	59	56	0	0	0	0	0	0	65	145	604
	PK	2.7	2.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.8	2.7	2.7
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	204	183	186	180	0	0	0	0	0	0	180	203	1,136
	PK	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
3	EQ5311	BOILER CONTROLS												
	ELEC	34	30	31	30	0	0	0	0	0	0	30	34	189
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg. 131 HW Equipment												
4		WATERTUBE BOILER												
	GAS	127	126	55	51	0	0	0	0	0	0	58	128	545
	PK	2.4	2.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.4	2.4
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
4	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
		Bldg. 129 HW Equipment												
5		WATERTUBE BOILER												
	GAS	76	70	41	39	0	0	0	0	0	0	39	68	333
	PK	1.5	1.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	1.5
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1771	1599	1771	1714	0	0	0	0	0	0	1714	1771	10,339
	PK	2.4	2.4	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4
5	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 151 HW Equipment														
6	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	571	554	131	127	0	0	0	0	0	0	141	517	2,041
	PK	4.4	4.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.7	4.4	4.4
Bldg. 154 HW Equipment														
7	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	1190	1168	253	211	0	0	0	0	0	0	253	1143	4,218
	PK	8.7	8.9	7.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	7.7	8.9	8.9
Bldg. 156 HW Equipment														
8		WATERTUBE BOILER												
	GAS	63	62	13	10	0	0	0	0	0	0	13	60	221
	PK	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	83	83	47	46	0	0	0	0	0	0	46	85	390
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
8	EQ5311	BOILER CONTROLS												
	ELEC	54	55	31	30	0	0	0	0	0	0	30	56	257
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 157 HW Equipment														
9	EQ2201	GAS FIRED UNIT HEATER												
	GAS	22	20	8	8	0	0	0	0	0	0	8	20	85
	PK	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
9	EQ5250	UNIT HEATER FAN												
	ELEC	15	13	15	14	0	0	0	0	0	0	14	15	87
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 159 HW Equipment														
10	EQ2201	GAS FIRED UNIT HEATER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	EQ5250	UNIT HEATER FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 152 HW Equipment														
11	EQ2201	GAS FIRED UNIT HEATER												
	GAS	169	170	45	28	0	0	0	0	0	0	46	161	619
	PK	1.2	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.2	1.2
11	EQ5250	UNIT HEATER FAN												
	ELEC	103	93	103	99	0	0	0	0	0	0	99	103	599
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO A-INSTALL EMS WATERSIDE EQ

EQUIPMENT ENERGY CONSUMPTION															
Ref	Equip	Monthly Consumption													
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total	
Bldg. 155 HW Equipment															
12	WATERTUBE BOILER														
	GAS	63	56	20	20	0	0	0	0	0	0	23	61	243	
	PK	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	
12	EQ5020	HEATING WATER CIRCULATION PUMP													
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433	
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	
12	EQ5311	BOILER CONTROLS													
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543	
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
Bldg. 158 HW Equipment															
13	EQ2201	GAS FIRED UNIT HEATER													
	GAS	108	105	24	21	0	0	0	0	0	0	25	103	386	
	PK	1.1	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.1	
13	EQ5250	UNIT HEATER FAN													
	ELEC	88	81	67	64	0	0	0	0	0	0	64	88	453	
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	
Bldg. 141 HW Equipment															
14	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN													
	ELEC	832	801	182	169	0	0	0	0	0	0	188	767	2,939	
	PK	3.7	3.7	2.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7	
Bldgs. 260 & 261 HW Equipment															
15	WATERTUBE BOILER														
	GAS	44	41	17	16	0	0	0	0	0	0	16	40	174	
	PK	0.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	
15	EQ5020	HEATING WATER CIRCULATION PUMP													
	ELEC	275	249	275	266	0	0	0	0	0	0	266	275	1,607	
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	
15	EQ5311	BOILER CONTROLS													
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543	
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
15	EQ5020	HEATING WATER CIRCULATION PUMP													
	ELEC	275	249	275	266	0	0	0	0	0	0	266	275	1,607	
	PK	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	
Bldg. 268 HW Equipment															
16	WATERTUBE BOILER														
	GAS	65	67	31	27	0	0	0	0	0	0	30	69	290	
	PK	1.2	1.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3	1.3	

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
16	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	417	376	417	403	0	0	0	0	0	0	403	417	2,433
	PK	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
16	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO B1 - WATER COOLED CENTRIFUGAL

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	96000	86815	102496	91856	99248	98352	92752	102496	91856	99248	91856	92752	1,145,727
	PK	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11383	11016	11383	11383	11016	11383	0	0	67,565
	PK	0.0	0.0	0.0	0.0	15.3	15.3	15.3	15.3	15.3	15.3	0.0	0.0	15.3
2		BASE UTILITY												
	CHILLD	0	0	0	0	7485	7243	7485	7485	7243	7485	0	0	44,425
	PK	0.0	0.0	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	0.0	0.0	10.1
1	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	14895	14992	17462	20527	15030	19095	0	0	102,000
	PK	0.0	0.0	0.0	0.0	92.3	98.7	97.2	102.2	91.0	85.4	0.0	0.0	102.2
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	4731	0	0	27,588
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO B1 - WATER COOLED CENTRIFUGAL

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	99	102	117	136	100	124	0	0	678
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.6
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	9447	0	0	32,303
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	4222	3203	2878	3293	3584	7101	0	0	24,282
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	377	286	257	294	320	634	0	0	2,168
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1008L	3-STG CENTRIFUGAL > 300 TONS												
	ELEC	0	0	0	0	53540	69020	84614	85947	61528	12435	0	0	367,084
	PK	0.0	0.0	0.0	0.0	233.2	249.9	245.0	257.1	245.0	208.9	0.0	0.0	257.1
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	6826	8482	9802	9653	7440	2046	0	0	44,249
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	401	513	616	619	449	103	0	0	2,701
	PK	0.0	0.0	0.0	0.0	1.7	1.8	1.7	1.7	1.7	1.6	0.0	0.0	1.8
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13689	17009	19657	19359	14920	4103	0	0	88,737
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	10937	13589	15705	15466	11920	3278	0	0	70,894
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	367	456	527	519	400	110	0	0	2,379
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO B2 - WATER COOLED CENTRIFUGAL VFD

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	96000	86815	102496	91856	99248	98352	92752	102496	91856	99248	91856	92752	1,145,727
	PK	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11383	11016	11383	11383	11016	11383	0	0	67,565
	PK	0.0	0.0	0.0	0.0	15.3	15.3	15.3	15.3	15.3	15.3	0.0	0.0	15.3
2		BASE UTILITY												
	CHILLD	0	0	0	0	7485	7243	7485	7485	7243	7485	0	0	44,425
	PK	0.0	0.0	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	0.0	0.0	10.1
1	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	14895	14992	17462	20527	15030	19095	0	0	102,000
	PK	0.0	0.0	0.0	0.0	92.3	98.7	97.2	102.2	91.0	85.4	0.0	0.0	102.2
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	4731	0	0	27,588
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO B2 - WATER COOLED CENTRIFUGAL VFD

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	99	102	117	136	100	124	0	0	678
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.6
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	9447	0	0	32,303
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	4222	3203	2878	3293	3584	7101	0	0	24,282
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	377	286	257	294	320	634	0	0	2,168
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	0	0	0	0	52023	66545	80185	80541	58692	13179	0	0	351,164
	PK	0.0	0.0	0.0	0.0	264.0	263.9	252.5	256.3	253.6	234.0	0.0	0.0	264.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	1686	3004	4587	5404	2810	89	0	0	17,581
	PK	0.0	0.0	0.0	0.0	12.1	13.5	16.5	18.6	14.4	9.5	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	400	510	612	614	446	104	0	0	2,687
	PK	0.0	0.0	0.0	0.0	1.8	1.8	1.7	1.7	1.7	1.7	0.0	0.0	1.8
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13689	17009	19657	19359	14920	4103	0	0	88,737
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	10937	13589	15705	15466	11920	3278	0	0	70,894
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	367	456	527	519	400	110	0	0	2,379
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO B3 - WATER COOLED SCREW

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	96000	86815	102496	91856	99248	98352	92752	102496	91856	99248	91856	92752	1,145,727
	PK	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11383	11016	11383	11383	11016	11383	0	0	67,565
	PK	0.0	0.0	0.0	0.0	15.3	15.3	15.3	15.3	15.3	15.3	0.0	0.0	15.3
2		BASE UTILITY												
	CHILLD	0	0	0	0	7485	7243	7485	7485	7243	7485	0	0	44,425
	PK	0.0	0.0	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	0.0	0.0	10.1
1	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	14895	14992	17462	20527	15030	19095	0	0	102,000
	PK	0.0	0.0	0.0	0.0	92.3	98.7	97.2	102.2	91.0	85.4	0.0	0.0	102.2
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	4731	0	0	27,588
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO B3 - WATER COOLED SCREW

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	99	102	117	136	100	124	0	0	678
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.6
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	9447	0	0	32,303
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	4222	3203	2878	3293	3584	7101	0	0	24,282
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	377	286	257	294	320	634	0	0	2,168
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	YSCRW22	YORK W.C. SCREW CHILLER												
	ELEC	0	0	0	0	57983	74676	91911	93348	67025	13048	0	0	397,991
	PK	0.0	0.0	0.0	0.0	274.1	292.0	286.2	299.1	286.2	247.3	0.0	0.0	299.1
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	6826	8482	9802	9653	7440	2046	0	0	44,249
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	405	518	622	626	454	104	0	0	2,729
	PK	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.7	0.0	0.0	1.8
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13689	17009	19657	19359	14920	4103	0	0	88,737
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
2	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	10937	13589	15705	15466	11920	3278	0	0	70,894
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	367	456	527	519	400	110	0	0	2,379
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO B4 - GAS ENGINE DRIVEN CHILLER

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	96000	86815	102496	91856	99248	98352	92752	102496	91856	99248	91856	92752	1,145,727
	PK	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11383	11016	11383	11383	11016	11383	0	0	67,565
	PK	0.0	0.0	0.0	0.0	15.3	15.3	15.3	15.3	15.3	15.3	0.0	0.0	15.3
2		BASE UTILITY												
	CHILLD	0	0	0	0	7514	7272	7514	7514	7272	7514	0	0	44,602
	PK	0.0	0.0	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	0.0	0.0	10.1
1	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	14895	13609	15555	16786	15030	19095	0	0	94,971
	PK	0.0	0.0	0.0	0.0	92.3	98.7	95.8	99.8	91.0	85.4	0.0	0.0	99.8
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5617	4261	3829	4381	4768	4731	0	0	27,588
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO C - REPLACE BLRS WITH BOILER PLANT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	96000	86815	102496	91856	99248	98352	92752	102496	91856	99248	91856	92752	1,145,727
	PK	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6	548.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	HOTLD	839	758	839	812	0	0	0	0	0	0	812	839	4,900
	PK	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
1		HIGH EFFICIENCY MODULAR FIRETUBE BOIL.												
	GAS	4050	3898	1161	888	0	0	0	0	0	0	1238	3755	14,990
	PK	20.0	20.0	8.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	8.0	20.0	20.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	5580	5040	5580	5400	0	0	0	0	0	0	5400	5580	32,580
	PK	7.5	7.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5	7.5
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## 01 Card - Job Information

Project: 03-0185.06 EEAP BOILER-CHILLER STUDY  
 Location: FT SAM HOUSTON, TEXAS  
 Client: CORPS OF ENGINEERS - FORT WORTH, TEXAS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: AREA 500, BLDGS. 590, 591, AND 592

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
	EXISTING CONDITION

## Card 20----- General Room Parameters -----

Room	Zone	Reference	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Floors	Rooms per	Depth	
5	5	BLDG 590	145	145	8	1.5		10				
10	10	BLDG 591	145	145	8	1.5		10				
15	15	592 ADMIN	74	74	8	1.5		10				
20	20	592 BARRACKS	299.5	300	8	1.5		10				

## Card 21----- Thermostat Parameters -----

Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Number	Design DB	RH	T'stat	T'stat	Design DB	Driftpoint	Schedule	Location	No. Hrs	On
			Driftpoint	Schedule				Flag	Average	Floor
5	78	50	78		70	70				
10	78	50	78		70	70				
15	78	50	78		70	70				
20	78	50	78		70	70				

## Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof		Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
		Equal to Floor?								
5	1	NO		87.5	88	0.14	37		68	
10	1	NO		87.5	88	0.14	37		68	
20	1	NO		141.5	142	0.06	37			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground	
					Constuc Type					Reflectance	Multiplier
5	1	583	10	0.24	58		350				
5	2	147.5	10	0.24	58		80				
5	3	583	10	0.24	58		170				
5	4	147.5	10	0.24	58		260				
10	1	583	10	0.24	58		350				
10	2	147.5	10	0.24	58		80				
10	3	583	10	0.24	58		170				
10	4	147.5	10	0.24	58		260				
15	1	72	11.3	0.20	58		0				
	2	45.5	11.3	0.20	58		90				
	3	72	11.3	0.20	58		180				
15	4	62	11.3	0.20	58		135				
20	1	103.1	56.5	0.20	58		0				
20	2	181.4	56.5	0.20	58		90				
20	3	72	45.2	0.20	58		180				
20	4	193.6	56.5	0.20	58		135				
20	5	169	56.5	0.20	58		270				
20	6	45	56.5	0.20	58		225				
20	7	156	56.5	0.20	58		315				

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External		Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value		Shading Type			Solar to Ret. Air	Visible Transmittance	
5	1	5	2.5	66	1.1	0.67						
5	2	5	2.5	6	1.1	0.67						
5	3	5	2.5	75	1.1	0.67						
5	4	5	2.5	75	1.1	0.67						
10	1	5	2.5	66	1.1	0.67						
10	2	5	2.5	6	1.1	0.67						
10	3	5	2.5	75	1.1	0.67						
10	4	5	2.5	75	1.1	0.67						
15	1	8	2.5	8	1.1	0.67						
	3	8	2.5	8	1.1	0.67						
15	4			16.3	1.1	0.67						
20	1	5	2.5	32	1.1	0.67						
20	2	5	2.5	80	1.1	0.67						

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
20	3	5	2.5	32	1.1	0.67					
20	4	5	2.5	116	1.1	0.67					
20	5	5	2.5	80	1.1	0.67					
20	7	5	2.5	80	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHBARRP	FSHBARRL								
10	FSHBARRP	FSHBARRL								
15	FSHOFFIC	FSHOFFIC								
20	FSHBARRP	FSHBARRL								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
							Fixture Type	ASHRAE2			Reference Point 1	Reference Point 2
5	47	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
10	47	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
15	13	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2					
20	307	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc		Energy Consump Value	Energy Consump Units	Energy Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Equipment Number	Equipment Descrip									
5	1	BARRACKS EQ	0.9	WATT-SF	FSHBARRL	NONE					
10	1	BARRACKS EQ	0.9	WATT-SF	FSHBARRL	NONE					
15	1	OFFICE EQ	0.8	WATT-SF	FSHOFFIC	NONE					
20	1	BARRACKS EQ	1.0	WATT-SF	FSHBARRL	NONE					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----			
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	1710	CFM	1710	CFM						
10	1710	CFM	1710	CFM						
20		CFM-P	20	CFM-P						
20	12040	CFM	12040	CFM						

## ----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING AIRSIDE EQUIPMENT

## Card 40----- System Type -----

## -----OPTIONAL VENTILATION SYSTEM-----

System	Ventil	Fan					
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	MZ						
2	MZ						
3	MZ						
4	MZ						

## Card 41----- Zone Assignment -----

System	Ref #1	Ref #2	Ref #3	Ref #4	Ref #5	Ref #6
ber	Begin	End	Begin	End	Begin	End
1	5	5				
2	10	10				
3	15	15				
4	20	20				

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	2.5										
2	2.5										
3	2.5										
4	2.5										

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main	Auxiliary
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil
1	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG
2	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG
	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG
	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG



## ----- Equipment Section Alternative #1 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description	--- Demand Limit --- Temperature Schedule Drift
1				EXISTING WATERSIDE EQUIPMENT	

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn Ref	Loads To Cool Ref	Equipment Sizing	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End	
1	1		1	1								
2	2		2	2								
3	3		3	4								

Card 62----- Cooling Equipment Parameters -----

Cool Ref	Equip Code	Num Of	-----COOLING-----			-----HEAT RECOVERY-----				Seq Order	Demand Seq	
Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Limit Number
1	ACC2	1	66.5	TONS	91.9	KW						
2	ACC2	1	66.5	TONS	91.9	KW						
3	EQ1008S	1	170	TONS	105	KW						

Card 63----- Cooling Pumps and References -----

Cool Ref	Full Load Value	Full Load Units	Full Load Value	Full Load Units	Full Load Value	Full Load Units	Full Load Value	Full Load Units	over Control	Cold Storage	Cooling Tower	Misc. Access.
1	3.7	KW										
2	3.7	KW										
3	11.2	KW	11.2	KW							1	

Card 65----- Heating Load Assignment -----

Load Assignment Reference	All Coil Loads To Heating Ref	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	1	1							
2	2	2	2							
3	3	3	4							

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc.	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control Strg Acc. Cogen Number
1	BOILERWT	1	2.2	KW	381.8	MBH	525	MBH		
2	BOILERWT	1	2.2	KW	623.9	MBH	850	MBH		
3	BOILERWT	1	3.7	KW	2037	MBH	2750	MBH		

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----				
Item	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	11.2											
2	11.2											
3	11.2											
4	44.7											

## Card 71----- Base Utility Parameters -----

Base Utility	Base Utility	Hourly Demand	Hourly Demand	Schedule Code	Energy Type	Equip Reference	Demand Limiting	Entering Temp	Leaving Temp
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	2			
5	PIPE-PUMP LOSSES	7.0	TONS	FTSAMCLG	CHILL-LD	3			
6	PIPE LOSSES	27.35	MBH	FTSAMHTG	HOT-LD	3			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling Tower	Cooling Tower	Capacity	Capacity	Energy Consump	Energy Consump	Fluid Type	Equip Tower	Demand Of	Percent Airflow	Low Spd Energy	Low Spd Energy
Code	Value	Units	Value	Units	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO D - INSTALL EMS

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Description	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	5	BLDG 590	145	145	8	1.5		10			
10	10	BLDG 591	145	145	8	1.5		10			
15	15	592 ADMIN	74	74	8	1.5		10			
20	20	592 BARRACKS	299.5	300	8	1.5		10			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	T'stat Location	Mass / No. Hrs Average	Carpet On Floor
5	78	50	78		70	70					
10	78	50	78		70	70					
15	78	50	78		70	70					
20	78	50	78		70	70					

## Card 22----- Roof Parameters -----

Room Number	Roof Number	Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	NO	87.5	88	0.14	37		68	
10	1	NO	87.5	88	0.14	37		68	
20	1	NO	141.5	142	0.06	37			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Const Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
5	1	583	10	0.24	58	350			
5	2	147.5	10	0.24	58	80			
5	3	583	10	0.24	58	170			
5	4	147.5	10	0.24	58	260			
5	1	583	10	0.24	58	350			
10	2	147.5	10	0.24	58	80			
10	3	583	10	0.24	58	170			
10	4	147.5	10	0.24	58	260			
15	1	72	11.3	0.20	58	0			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
15	2	45.5	11.3	0.20	58	90			
15	3	72	11.3	0.20	58	180			
15	4	62	11.3	0.20	58	135			
20	1	103.1	56.5	0.20	58	0			
20	2	181.4	56.5	0.20	58	90			
20	3	72	45.2	0.20	58	180			
20	4	193.6	56.5	0.20	58	135			
20	5	169	56.5	0.20	58	270			
20	6	45	56.5	0.20	58	225			
20	7	156	56.5	0.20	58	315			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External	Internal	Percent Solar to Ret. Air	Visible Transmittance	Inside
							Shading Type	Shading Type			Visible Reflectance
5	1	5	2.5	66	1.1	0.67					
5	2	5	2.5	6	1.1	0.67					
	3	5	2.5	75	1.1	0.67					
	4	5	2.5	75	1.1	0.67					
10	1	5	2.5	66	1.1	0.67					
10	2	5	2.5	6	1.1	0.67					
10	3	5	2.5	75	1.1	0.67					
10	4	5	2.5	75	1.1	0.67					
15	1	8	2.5	8	1.1	0.67					
15	3	8	2.5	8	1.1	0.67					
15	4			16.3	1.1	0.67					
20	1	5	2.5	32	1.1	0.67					
20	2	5	2.5	80	1.1	0.67					
20	3	5	2.5	32	1.1	0.67					
20	4	5	2.5	116	1.1	0.67					
20	5	5	2.5	80	1.1	0.67					
20	7	5	2.5	80	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHBARRP	FSHBARRL				BARRSCHD				
10	FSHBARRP	FSHBARRL				BARRSCHD				
15	FSHOFFIC	FSHOFFIC				DAYSCHED				
20	FSHBARRP	FSHBARRL				BARRSCHD				

## 01 Card - Job Information

-----

Project: 03-0185.06 EEAP BOILER-CHILLER STUDY  
 Location: FT SAM HOUSTON, TEXAS  
 Client: CORPS OF ENGINEERS - FORT WORTH, TEXAS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: AREA 500, BLDGS. 590, 591, AND 592

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	EXISTING CONDITION

## Card 20----- General Room Parameters -----

Zone							Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	
5	5	BLDG 590	145	145	8	1.5		10			
10	10	BLDG 591	145	145	8	1.5		10			
15	15	592 ADMIN	74	74	8	1.5		10			
20	20	592 BARRACKS	299.5	300	8	1.5		10			

## Card 21----- Thermostat Parameters -----

	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	78	50	78		70	70				
10	78	50	78		70	70				
15	78	50	78		70	70				
20	78	50	78		70	70				

## Card 22----- Roof Parameters -----

Roof									
Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	87.5	88	0.14	37		68	
10	1	NO	87.5	88	0.14	37		68	
20	1	NO	141.5	142	0.06	37			

## Card 24----- Wall Parameters -----

Wall									
Wall									Ground
Room	Wall	Wall	Wall	Wall	Constuc	Wall	Wall	Wall	Reflectance
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Multiplier
5	1	583	10	0.24	58	350			
5	2	147.5	10	0.24	58	80			
5	3	583	10	0.24	58	170			
5	4	147.5	10	0.24	58	260			
10	1	583	10	0.24	58	350			
10	2	147.5	10	0.24	58	80			
10	3	583	10	0.24	58	170			
10	4	147.5	10	0.24	58	260			
15	1	72	11.3	0.20	58	0			
15	2	45.5	11.3	0.20	58	90			
15	3	72	11.3	0.20	58	180			
15	4	62	11.3	0.20	58	135			
20	1	103.1	56.5	0.20	58	0			
20	2	181.4	56.5	0.20	58	90			
20	3	72	45.2	0.20	58	180			
20	4	193.6	56.5	0.20	58	135			
20	5	169	56.5	0.20	58	270			
20	6	45	56.5	0.20	58	225			
20	7	156	56.5	0.20	58	315			

## Card 25----- Wall/Glass Parameters -----

Wall/Glass Parameters												
Pct Glass							External					
Room	Wall	Glass	Glass	Pct Glass	Glass	Shading	Shading	Shading	Shading	Percent	Visible	Inside
Number	Number	Length	Width	or No. of	U-Value	Coefficient	Type	Type	Type	Solar to	Transmittance	Visible
5	1	5	2.5	66	1.1	0.67				Ret. Air		Reflectance
5	2	5	2.5	6	1.1	0.67						
5	3	5	2.5	75	1.1	0.67						
5	4	5	2.5	75	1.1	0.67						
10	1	5	2.5	66	1.1	0.67						
10	2	5	2.5	6	1.1	0.67						
10	3	5	2.5	75	1.1	0.67						
10	4	5	2.5	75	1.1	0.67						
15	1	8	2.5	8	1.1	0.67						
15	3	8	2.5	8	1.1	0.67						
15	4			16.3	1.1	0.67						
20	1	5	2.5	32	1.1	0.67						
20	2	5	2.5	80	1.1	0.67						

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
20	3	5	2.5	32	1.1	0.67					
20	4	5	2.5	116	1.1	0.67					
20	5	5	2.5	80	1.1	0.67					
20	7	5	2.5	80	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHBARRP	FSHBARRL								
10	FSHBARRP	FSHBARRL								
15	FSHOFFIC	FSHOFFIC								
20	FSHBARRP	FSHBARRL								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Ballast Factor	Percent --- Daylighting ---		
							Fixture Type			Lights to Ret. Air	Reference Point 1	Reference Point 2
5	47	PEOPLE	250	200	1.0		WATT-SF	ASHRAE2				
10	47	PEOPLE	250	200	1.0		WATT-SF	ASHRAE2				
15	13	PEOPLE	250	200	2.2		WATT-SF	ASHRAE2				
20	307	PEOPLE	250	200	2.0		WATT-SF	ASHRAE2				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Equipment Number	Descrip									
5	1	BARRACKS EQ	0.9		WATT-SF	FSHBARRL	NONE				
10	1	BARRACKS EQ	0.9		WATT-SF	FSHBARRL	NONE				
15	1	OFFICE EQ	0.8		WATT-SF	FSHOFFIC	NONE				
20	1	BARRACKS EQ	1.0		WATT-SF	FSHBARRL	NONE				

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		Value	Units
5	1710	CFM	1710	CFM						
10	1710	CFM	1710	CFM						
15	20	CFM-P	20	CFM-P						
20	12040	CFM	12040	CFM						

## ----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING AIRSIDE EQUIPMENT

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System		Ventil					Fan
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	MZ						
2	MZ						
3	MZ						
4	MZ						

## Card 41----- Zone Assignment -----

System												
Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	5	5										
2	10	10										
3	15	15										
4	20	20										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	2.5										
2	2.5										
3	2.5										
4	2.5										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		



## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Equipment Description	Demand Limit Temperature Schedule	Drift
1				EXISTING WATERSIDE EQUIPMENT		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn Ref	Loads To	Equipment	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End	
1	1		1	1								
2	2		2	2								
3	3		3	4								

## Card 62----- Cooling Equipment Parameters -----

Cool Equip Ref	Code	Num Of	-----COOLING-----			-----HEAT RECOVERY-----				Seq	Demand		
			--Capacity--	Value	Units	Value	Units	Value	Units	Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	ACC2	1	66.5	TONS	91.9	KW							
2	ACC2	1	66.5	TONS	91.9	KW							
3	EQ1008S	1	170	TONS	105	KW							

## Card 63----- Cooling Pumps and References -----

Cool Ref	---CHILLED WATER---	Full Load	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
1	3.7	KW																	
2	3.7	KW																	
3	11.2	KW		11.2	KW														

## Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment Reference	Loads To	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End	
1	1	1	1								
2	2	2	2								
3	3	3	4								

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy		Seq	Switch	Demand				
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit		
Number	Name	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILERWT	1	2.2	KW	381.8	MBH	525	MBH				
2	BOILERWT	1	2.2	KW	623.9	MBH	850	MBH				
3	BOILERWT	1	3.7	KW	2037	MBH	2750	MBH				

## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt	Room	Opt			
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	11.2											
2	11.2											
3	11.2											
4	44.7											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand				
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	2			
5	PIPE-PUMP LOSSES	7.0	TONS	FTSAMCLG	CHILL-LD	3			
6	PIPE LOSSES	27.35	MBH	FTSAMHTG	HOT-LD	3			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy		Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO D - INSTALL EMS

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	5	BLDG 590	145	145	8	1.5		10			
10	10	BLDG 591	145	145	8	1.5		10			
15	15	592 ADMIN	74	74	8	1.5		10			
20	20	592 BARRACKS	299.5	300	8	1.5		10			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	Mass / No. Hrs	Carpet On Average Floor
5	78	50	78		70	70				
10	78	50	78		70	70				
15	78	50	78		70	70				
20	78	50	78		70	70				

## Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	NO	87.5	88	0.14	37		68	
10	1	NO	87.5	88	0.14	37		68	
20	1	NO	141.5	142	0.06	37			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
5	1	583	10	0.24	58	350			
5	2	147.5	10	0.24	58	80			
5	3	583	10	0.24	58	170			
5	4	147.5	10	0.24	58	260			
10	1	583	10	0.24	58	350			
10	2	147.5	10	0.24	58	80			
10	3	583	10	0.24	58	170			
10	4	147.5	10	0.24	58	260			
15	1	72	11.3	0.20	58	0			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc	Type				Reflectance Multiplier
15	2	45.5	11.3	0.20	58		90			
15	3	72	11.3	0.20	58		180			
15	4	62	11.3	0.20	58		135			
20	1	103.1	56.5	0.20	58		0			
20	2	181.4	56.5	0.20	58		90			
20	3	72	45.2	0.20	58		180			
20	4	193.6	56.5	0.20	58		135			
20	5	169	56.5	0.20	58		270			
20	6	45	56.5	0.20	58		225			
20	7	156	56.5	0.20	58		315			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
5	1	5	2.5	66	1.1	0.67					
5	2	5	2.5	6	1.1	0.67					
5	3	5	2.5	75	1.1	0.67					
5	4	5	2.5	75	1.1	0.67					
10	1	5	2.5	66	1.1	0.67					
10	2	5	2.5	6	1.1	0.67					
10	3	5	2.5	75	1.1	0.67					
10	4	5	2.5	75	1.1	0.67					
15	1	8	2.5	8	1.1	0.67					
15	3	8	2.5	8	1.1	0.67					
15	4			16.3	1.1	0.67					
20	1	5	2.5	32	1.1	0.67					
20	2	5	2.5	80	1.1	0.67					
20	3	5	2.5	32	1.1	0.67					
20	4	5	2.5	116	1.1	0.67					
20	5	5	2.5	80	1.1	0.67					
20	7	5	2.5	80	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHBARRP	FSHBARRL				BARRSCHD				
10	FSHBARRP	FSHBARRL				BARRSCHD				
15	FSHOFFIC	FSHOFFIC				DAYSCHED				
20	FSHBARRP	FSHBARRL				BARRSCHD				

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Temperature	Drift
Number	Time of Day	Time of Day	Limit	Schedule	
3				ECO E1 - WATER COOLED CENTRIFUGAL	

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	4										

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----	-----HEAT RECOVERY-----	Seq	Demand								
Ref	Code	Of	--Capacity--	---Energy---	--Capacity--	---Energy---	Order	Seq	Limit				
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008L	1	300	TONS	171	KW							

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	18.6	KW	14.9	KW					1	

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand			
Utility	Utility	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Temp	Temp
1	DISTRIBUTION LOS	11.0	TONS	FTSAMCLG	CHILL-LD	1		

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd					
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			11.2	KW	T-WATER	CTOWER	1			

----- Equipment Section Alternative #4 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Temperature	Drift
Number	Time of Day	Time of Day	Limit	Schedule	



Card 60----- Cooling Load Assignment-----  
 Load All Coil Cooling  
 Asgn Loads To Equipment -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Ref Cool Ref Sizing Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 1 4

Card 62----- Cooling Equipment Parameters -----  

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1009	1	300	TONS	171	KW							

Card 63----- Cooling Pumps and References -----  
 Cool ---CHILLED WATER--- -----CONDENSER----- ---HT REC or AUX--- Switch-  
 Ref Full Load Full Load Full Load Full Load Full Load Full Load over Cold Cooling Misc.  
 Num Value Units Value Units Value Units Control Storage Tower Access.  
 1 18.6 KW 14.9 KW 1

Card 71----- Base Utility Parameters -----  

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	11.0	TONS	FTSAMCLG	CHILL-LD	1			

Card 74----- Condenser / Cooling Tower Parameters -----  

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd					
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			11.2	KW	T-WATER	CTOWER	1			

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Limit	Temperature	Demand Limit
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				ECO E3 - WATER COOLED SCREW		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	4										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----	-----HEAT RECOVERY-----	Seq	Demand
Ref Code	Of	--Capacity--	---Energy---	--Capacity--	---Energy---
Num Name	Units	Value	Units	Value	Units
1 YSCRW22	1	300	TONS	186	KW

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	18.6	KW	14.9	KW

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand
Utility	Utility	Demand	Demand	Reference	Limiting
Number	Descrip	Value	Units	Code	Type
1	DISTRIBUTION LOS	11.0	TONS	FTSAMCLG	CHILL-LD

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid
Ref	Code	Value	Units	Value	Units	Type
1	EQ5100			11.2	KW	T-WATER



## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
							Fixture Type			Reference Point 1	Reference Point 2
5	47	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2				
10	47	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2				
15	13	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2				
20	307	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
10	1	BARRACKS EQ	0.9	WATT-SF	FSHBARRL	NONE					
15	1	OFFICE EQ	0.8	WATT-SF	FSHOFFIC	NONE					
20	1	BARRACKS EQ	1.0	WATT-SF	FSHBARRL	NONE					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----		-----Heating-----		-----Infiltration-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	1710	CFM	1710	CFM								
10	1710	CFM	1710	CFM								
15	20	CFM-P	20	CFM-P								
20	12040	CFM	12040	CFM								

## ----- System Section Alternative #2 -----

## Card 39- System Alternative

Number	Description
2	ECO D - INSTALL EMS AIRSIDE EQ

## Card 40----- System Type -----

System Set Number	System Type	-----OPTIONAL VENTILATION SYSTEM-----					
		Ventil Deck Location	Cooling SADBvh	Heating SADBvh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	MZ						
2	MZ						
3	MZ						
4	MZ						

## Card 41----- Zone Assignment -----

## System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	5	5										
2	10	10										
3	15	15										
4	20	20										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	2.5										
2	2.5										
3	2.5										
4	2.5										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery							
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --				
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	
1	DRY-BULB	65	100											
2	DRY-BULB	65	100											
3	DRY-BULB	65	100											
4	DRY-BULB	65	100											

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main		Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech. Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity Coil
1	FTSAMCLG	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
2	FTSAMCLG	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
3	FTSAMCLG	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	
4	FTSAMCLG	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG	

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1			OPSTRB	OPSTPB					
2			OPSTRB	OPSTPB					
3			OPSTART	OPSTOP					
4			OPSTRB	OPSTPB					

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Equipment Description	Demand Limit Temperature Schedule	Drift
2				ECO D - INSTALL EMS WATERSIDE EQ		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1					1	1							
2	2					2	2							
3	3					3	4							

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	Ref Code	Of	Units	Value	Units	Value	Units	Value	Units	Value	Units	Seq	Order	Seq	Limit
1	ACC2	1	66.5	TONS	91.9	KW										
2	ACC2	1	66.5	TONS	91.9	KW										
3	EQ1008S	1	170	TONS	105	KW										

## Card 63----- Cooling Pumps and References -----

Cool	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
1	3.7	KW									
2	3.7	KW									
3	11.2	KW	11.2	KW							

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1	10					85	55	
2	10					85	55	
3	10					85	55	

## Card 65----- Heating Load Assignment -----

Load All Coil

Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	1								
2	2	2	2								
3	3	3	4								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Number	Control
1	BOILERWT	1	2.2	KW	381.8	MBH	525	MBH
2	BOILERWT	1	2.2	KW	623.9	MBH	850	MBH
3	BOILERWT	1	3.7	KW	2037	MBH	2750	MBH

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

System Number	-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY---			
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
1	11.2											
2	11.2											
3	11.2											
4	44.7											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP LOSSES	1.92	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE LOSSES	10.20	MBH	FTSAMHTG	HOT-LD	2			
5	PIPE-PUMP LOSSES	7.0	TONS	FTSAMCLG	CHILL-LD	3			
6	PIPE LOSSES	27.35	MBH	FTSAMHTG	HOT-LD	3			

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Time of Day	Time of Day	Limit	Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift	
4				ECO F - REPLACE BLRS WITH CENTRAL BLRS			

## Card 65----- Heating Load Assignment -----

Load	All Coil	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Assignment	Loads To	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	1	4							

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc. Acc.	Cogen	Demand Limit			
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILHEFT	1	7.5	KW	1830	MBH	2000	MBH						

## Card 71----- Base Utility Parameters -----

Base Utility	Base Utility	Hourly Demand	Hourly Demand	Schedule	Energy Type	Equip Reference	Demand Limiting	Entering Temp	Leaving Temp
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	48.0	MBH	FTSAMHTG	HOT-LD	1			

## Utility Description Reference Table

## Schedules:

BARRSCHD COOLING FAN SCHEDULE CODE FOR BARACKS  
DAYSCHED COOLING FAN SCHEDULE CODE  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG BEAP BOILER/CHILLER STUDY  
FTSAMHTG BEAP BOILER/CHILLER STUDY  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE  
OPSTPB OPTIMUM STOP COOLING FAN SCHED. CODE  
OPSTRTB OPTIMUM START COOLING FAN SCHED. CODE

## System:

MZ MULTIZONE SYSTEM

## Equipment:

## Cooling:

ACC2 TYPICAL AIR COOLED RECIP CHILLER  
EQ1008L 3-STG CENTRIFUGAL > 300 TONS  
EQ1008S 3-STG CENTRIFUGAL < 300 TONS  
EQ1009 3-STG CTV WITH VARIABLE FREQUENCY DRV

## Heating:

BOILERWT WATERTUBE BOILER

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS

Schedule Name: BARRSCHD

Project: COOLING FAN SCHEDULE CODE FOR B

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
8 0  
17 100  
24

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	0
6	100
17	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
12	100
16	0
24	



Schedule Name: FSHBARRL  
Project: F.S.H. BARRACKS LIGHT\MISC. SCH  
Location: F.S.H. - SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHT

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 5  
17 80  
22 5  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 5  
8 50  
22 5  
24

Schedule Name: FSHBARRP  
Project: F.S.H. BARRACKS PEOPLE SCHEDULE  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR BARRACKS

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 100  
8 0  
17 80  
22 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 50  
24

Schedule Name: FSHOFFIC  
Project: F.S.H. OFFICE INTERNAL LOAD SCH  
Location: F.S.H. SAN ANTONIO, TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC. - JTC,  
Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
12 10  
13 100  
17 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	0	
24		

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	100	
24		

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	0	
24		

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Schedule Name: OPSTART  
Project: OPTIMUM START COOLING FAN SCHED  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0  
whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour	Util Percent
0	0
6	100
7	0
24	

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
16	100
17	0
24	

Schedule Name: OPSTPB

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DET AMOUNT OF TIME FAN OF IN B

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor				Optional Offset	
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
7	100
8	0
24	



Schedule Name: OPSTRTB

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DET AMOUNT OF TIME FOR FAN ON

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
16	100
17	0
24	

Utility Description Reference Table

Schedules:

FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE

FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE

FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE

FTSAMCLG EEAP BOILER/CHILLER STUDY

FTSAMHTG EEAP BOILER/CHILLER STUDY

System:

MZ MULTIZONE SYSTEM

Equipment:

Cooling:

YSCRW22 YORK W.C. SCREW CHILLER

Heating:

BOILHEFT HIGH EFFICIENCY MODULAR FIRETUBE BOIL.

Tower:

EQ5100 COOLING TOWER FANS

```
*****  
*****  
**                                     **  
**          T R A C E    6 0 0    A N A L Y S I S          **  
**                                     **  
**          by  HUITT & ZOLLARS          **  
**                                     **  
*****  
*****
```

EEAP BOILER  
FT SAM HOUSTON, TEXAS  
CORPS OF ENGINEERS - FORT WORTH, TEXAS  
HUITT-ZOLLARS, INC.  
AREA 500, BLDGS. 590, 591, AND 592

Weather File Code:

Location:	SAN ANTONIO, TEXAS
Latitude:	29.0 (deg)
Longitude:	98.0 (deg)
Time Zone:	6
Elevation:	792 (ft)
Barometric Pressure:	29.0 (in. Hg)
Summer Clearness Number:	0.90
Winter Clearness Number:	0.90
Summer Design Dry Bulb:	97 (F)
Summer Design Wet Bulb:	76 (F)
Winter Design Dry Bulb:	30 (F)
Summer Ground Relectance:	0.20
Winter Ground Relectance:	0.20
Air Density:	0.0738 (Lbm/cuft)
Air Specific Heat:	0.2444 (Btu/lbm/F)
Density-Specific Heat Prod:	1.0818 (Btu-min./hr/cuft/F)
Latent Heat Factor:	4,761.9 (Btu-min./hr/cuft)
Enthalpy Factor:	4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 15:33: 4 2/17/96  
Dataset Name: FSH500 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			----- Heating Airflow -----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	15.7	9	412	-97,421	58	493	8,073.0	0	0	0.0	0	0
5 - 10	31.3	4	165	-194,842	22	189	16,146.0	0	0	0.0	0	0
10 - 15	47.0	5	227	-292,263	12	97	24,218.9	0	0	0.0	0	0
15 - 20	62.7	8	369	-389,684	8	64	32,291.9	0	0	0.0	0	0
20 - 25	78.3	10	439	-487,105	0	0	40,364.9	0	0	0.0	0	0
25 - 30	94.0	10	428	-584,526	0	0	48,437.9	0	0	0.0	0	0
30 - 35	109.7	9	388	-681,948	0	0	56,510.9	0	0	0.0	0	0
35 - 40	125.3	9	400	-779,369	0	0	64,583.8	0	0	0.0	0	0
40 - 45	141.0	6	269	-876,790	0	0	72,656.8	0	0	0.0	0	0
45 - 50	156.7	4	197	-974,211	0	0	80,729.8	0	0	0.0	0	0
50 - 55	172.3	7	321	-1,071,632	0	0	88,802.8	0	0	0.0	0	0
55 - 60	188.0	6	287	-1,169,053	0	0	96,875.8	0	0	0.0	0	0
60 - 65	203.7	3	148	-1,266,474	0	0	104,948.8	0	0	0.0	0	0
65 - 70	219.3	6	258	-1,363,895	0	0	113,021.7	0	0	0.0	0	0
70 - 75	235.0	1	65	-1,461,316	0	0	121,094.7	0	0	0.0	0	0
75 - 80	250.7	1	43	-1,558,737	0	0	129,167.7	0	0	0.0	0	0
80 - 85	266.3	0	0	-1,656,159	0	0	137,240.7	0	0	0.0	0	0
85 - 90	282.0	0	0	-1,753,580	0	0	145,313.7	0	0	0.0	0	0
90 - 95	297.7	0	0	-1,851,001	0	0	153,386.7	0	0	0.0	0	0
95 - 100	313.3	0	0	-1,948,422	0	0	161,459.6	100	8,760	0.0	0	0
Hours Off	0.0	0	4,344	0	0	7,917	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	1428	1382	1428	1428	1382	1428	0	0	8,479
	PK	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	1.9
2		BASE UTILITY												
	HOTLD	76	69	76	73	0	0	0	0	0	0	73	76	443
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3		BASE UTILITY												
	CHILLD	0	0	0	0	1428	1382	1428	1428	1382	1428	0	0	8,479
	PK	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	1.9
4		BASE UTILITY												
	HOTLD	76	69	76	73	0	0	0	0	0	0	73	76	443
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	5208	5040	5208	5208	5040	5208	0	0	30,912
	PK	0.0	0.0	0.0	0.0	7.0	7.0	7.0	7.0	7.0	7.0	0.0	0.0	7.0
6		BASE UTILITY												
	HOTLD	203	184	203	197	0	0	0	0	0	0	197	203	1,188
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
Bldg. 590 CHW Equipment														
1	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	21167	25907	31358	31312	24035	10473	0	0	144,252
	PK	0.0	0.0	0.0	0.0	73.2	73.1	78.5	78.2	69.6	55.0	0.0	0.0	78.5
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 591 CHW Equipment														
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	21167	25907	31358	31312	24035	10473	0	0	144,252
	PK	0.0	0.0	0.0	0.0	73.2	73.1	78.5	78.2	69.6	55.0	0.0	0.0	78.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 592 CHW Equipment														
3	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	35931	34392	41775	42986	33567	13473	0	0	202,124
	PK	0.0	0.0	0.0	0.0	99.6	101.1	104.1	105.4	102.5	72.0	0.0	0.0	105.4
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	5337	0	0	60,050
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	237	225	272	277	217	85	0	0	1,314
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.5	0.0	0.0	0.6

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## EXISTING WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption													
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total	
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME													
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459	
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2	
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)													
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459	
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2	
3	EQ5300	CONTROL PANEL & INTERLOCKS													
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416	
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0	
Bldg. 590 Airside Fans															
1	TYPFAN	GENERIC FAN													
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112	
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
Bldg. 591 Airside Fans															
2	TYPFAN	GENERIC FAN													
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112	
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
Bldg. 592 Airside Fans															
3	TYPFAN	GENERIC FAN													
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112	
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
Bldg. 590 HW Equipment															
4	TYPFAN	GENERIC FAN													
	ELEC	33257	30038	33257	32184	33257	32184	33257	33257	32184	33257	32184	33257	391,572	
	PK	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	
Bldg. 590 HW Equipment															
1		WATERTUBE BOILER													
	GAS	280	237	104	101	0	0	0	0	0	0	101	148	972	
	PK	0.8	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.8	
Bldg. 591 HW Equipment															
1	EQ5020	HEATING WATER CIRCULATION PUMP													
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557	
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2	
Bldg. 591 HW Equipment															
1	EQ5311	BOILER CONTROLS													
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543	
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
Bldg. 591 HW Equipment															
2		WATERTUBE BOILER													
	GAS	278	235	103	100	0	0	0	0	0	0	100	145	962	
	PK	0.8	0.8	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.8	

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1258	1100	818	792	0	0	0	0	0	0	792	915	5,676
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
2	EQ5311	BOILER CONTROLS												
	ELEC	72	63	47	45	0	0	0	0	0	0	45	52	322
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 592 HW Equipment														
3		WATERTUBE BOILER												
	GAS	641	456	275	266	0	0	0	0	0	0	266	282	2,185
	PK	4.1	4.0	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	4.1
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1761	1413	1376	1332	0	0	0	0	0	0	1332	1387	8,603
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
3	EQ5311	BOILER CONTROLS												
	ELEC	59	48	47	45	0	0	0	0	0	0	45	47	291
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



## SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2

ECO D - INSTALL EMS AIRSIDE EQ

## ----- SYSTEM LOAD PROFILE -----

## System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	15.7	42	1,655	-126,784	69	428	8,073.0	40	3,402	0.0	0	0
5 - 10	31.3	4	165	-253,567	24	148	16,146.0	0	0	0.0	0	0
10 - 15	47.0	6	240	-380,351	7	42	24,218.9	0	0	0.0	0	0
15 - 20	62.7	6	251	-507,135	0	3	32,291.9	0	0	0.0	0	0
20 - 25	78.3	8	300	-633,918	0	3	40,364.9	0	0	0.0	0	0
25 - 30	94.0	4	152	-760,702	0	0	48,437.9	0	0	0.0	0	0
30 - 35	109.7	1	56	-887,486	0	0	56,510.9	0	0	0.0	0	0
35 - 40	125.3	1	42	-1,014,269	0	0	64,583.8	0	0	0.0	0	0
40 - 45	141.0	0	0	-1,141,053	0	0	72,656.8	0	0	0.0	0	0
45 - 50	156.7	0	18	-1,267,836	0	0	80,729.8	0	0	0.0	0	0
50 - 55	172.3	2	59	-1,394,620	0	0	88,802.8	0	0	0.0	0	0
55 - 60	188.0	0	18	-1,521,404	0	0	96,875.8	0	0	0.0	0	0
60 - 65	203.7	3	101	-1,648,188	0	0	104,948.8	0	0	0.0	0	0
65 - 70	219.3	0	0	-1,774,971	0	0	113,021.7	0	0	0.0	0	0
70 - 75	235.0	0	8	-1,901,755	0	0	121,094.7	0	0	0.0	0	0
75 - 80	250.7	0	19	-2,028,538	0	0	129,167.7	0	0	0.0	0	0
80 - 85	266.3	1	32	-2,155,322	0	0	137,240.7	0	0	0.0	0	0
85 - 90	282.0	3	102	-2,282,106	0	0	145,313.7	0	0	0.0	0	0
90 - 95	297.7	8	333	-2,408,889	0	0	153,386.7	0	0	0.0	0	0
95 - 100	313.3	10	375	-2,535,673	0	0	161,459.6	60	5,110	0.0	0	0
Hours Off	0.0	0	4,834	0	0	8,136	0.0	0	248	0.0	0	8,760

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO D - INSTALL EMS WATERSIDE EQ

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	1428	1382	1428	1428	1382	1428	0	0	8,479
	PK	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	1.9
2		BASE UTILITY												
	HOTLD	76	69	76	73	0	0	0	0	0	0	73	76	443
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3		BASE UTILITY												
	CHILLD	0	0	0	0	1428	1382	1428	1428	1382	1428	0	0	8,479
	PK	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	1.9
4		BASE UTILITY												
	HOTLD	76	69	76	73	0	0	0	0	0	0	73	76	443
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO D - INSTALL EMS WATERSIDE EQ

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	5208	5040	5208	5208	5040	5208	0	0	30,912
	PK	0.0	0.0	0.0	0.0	7.0	7.0	7.0	7.0	7.0	7.0	0.0	0.0	7.0
6		BASE UTILITY												
	HOTLD	203	184	203	197	0	0	0	0	0	0	197	203	1,188
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
1	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
		Bldg. 590 CHW Equipment												
	ELEC	0	0	0	0	15767	20059	24563	24360	17847	4557	0	0	107,153
	PK	0.0	0.0	0.0	0.0	77.1	80.7	83.8	83.5	77.5	42.1	0.0	0.0	83.8
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
		Bldg. 591 CHW Equipment												
	ELEC	0	0	0	0	15767	20059	24563	24360	17847	4557	0	0	107,153
	PK	0.0	0.0	0.0	0.0	77.1	80.7	83.8	83.5	77.5	42.1	0.0	0.0	83.8
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
3	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
		Bldg. 592 CHW Equipment												
	ELEC	0	0	0	0	34706	31338	34879	35318	29695	6949	0	0	172,885
	PK	0.0	0.0	0.0	0.0	99.6	102.7	104.1	105.4	102.5	71.7	0.0	0.0	105.4
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	215	189	211	212	178	34	0	0	1,040
	PK	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.5	0.0	0.0	0.6

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO D - INSTALL EMS WATERSIDE EQ

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 590 Airside Fans														
1	TYPFAN	GENERIC FAN												
	ELEC	4861	4390	4861	4704	4861	4704	4861	4861	4704	4861	4704	4861	57,232
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Bldg. 591 Airside Fans														
2	TYPFAN	GENERIC FAN												
	ELEC	4861	4390	4861	4704	4861	4704	4861	4861	4704	4861	4704	4861	57,232
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Bldg. 592 Airside Fans														
3	TYPFAN	GENERIC FAN												
	ELEC	3125	3225	3730	3584	3573	3158	3293	3350	3203	3125	3584	3662	40,612
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Bldg. 590 HW Equipment														
1		WATERTUBE BOILER												
	GAS	244	203	104	101	0	0	0	0	0	0	101	135	888
	PK	0.8	2.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	2.3
Bldg. 591 HW Equipment														
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 591 HW Equipment														
2		WATERTUBE BOILER												
	GAS	242	201	103	100	0	0	0	0	0	0	100	132	878
	PK	0.8	2.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	2.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO D - INSTALL EMS WATERSIDE EQ

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1151	966	818	792	0	0	0	0	0	0	792	882	5,401
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
2	EQ5311	BOILER CONTROLS												
	ELEC	65	55	47	45	0	0	0	0	0	0	45	50	307
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Bldg: 592 HW Equipment												
3		WATERTUBE BOILER												
	GAS	561	323	275	266	0	0	0	0	0	0	266	275	1,965
	PK	4.1	3.2	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	4.1
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1709	1317	1376	1332	0	0	0	0	0	0	1332	1376	8,443
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
3	EQ5311	BOILER CONTROLS												
	ELEC	58	44	47	45	0	0	0	0	0	0	45	47	285
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO E1 - WATER COOLED CENTRIFUGAL

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	8184	7920	8184	8184	7920	8184	0	0	48,576
	PK	0.0	0.0	0.0	0.0	11.0	11.0	11.0	11.0	11.0	11.0	0.0	0.0	11.0
1	EQ1008L	3-STG CENTRIFUGAL > 300 TONS												
	ELEC	0	0	0	0	46082	47752	57584	58896	46577	19333	0	0	276,223
	PK	0.0	0.0	0.0	0.0	162.2	160.9	168.4	171.7	159.8	101.3	0.0	0.0	171.7
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	3952	0	0	45,078
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	322	329	400	405	317	125	0	0	1,899
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	0.8	0.0	0.0	1.1

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3

## ECO E1 - WATER COOLED CENTRIFUGAL

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO E2 - WATER COOLED CENTRIFUGAL VFD

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	8184	7920	8184	8184	7920	8184	0	0	48,576
	PK	0.0	0.0	0.0	0.0	11.0	11.0	11.0	11.0	11.0	11.0	0.0	0.0	11.0
1	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	0	0	0	0	42540	42831	51952	52516	41374	15486	0	0	246,700
	PK	0.0	0.0	0.0	0.0	171.0	168.3	171.0	172.0	162.7	106.2	0.0	0.0	172.0
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	731	1200	2028	2534	1261	0	0	0	7,754
	PK	0.0	0.0	0.0	0.0	8.2	8.4	10.1	11.2	9.1	2.7	0.0	0.0	11.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	319	325	395	399	312	122	0	0	1,872
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	0.8	0.0	0.0	1.1



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO E2 - WATER COOLED CENTRIFUGAL VFD

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
ECO E3 - WATER COOLED SCREW

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	8184	7920	8184	8184	7920	8184	0	0	48,576
	PK	0.0	0.0	0.0	0.0	11.0	11.0	11.0	11.0	11.0	11.0	0.0	0.0	11.0
1	YSCRW22	YORK W.C. SCREW CHILLER												
	ELEC	0	0	0	0	46340	47649	56904	58164	46507	18305	0	0	273,868
	PK	0.0	0.0	0.0	0.0	177.3	175.8	183.3	186.0	174.4	102.6	0.0	0.0	186.0
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	3937	0	0	45,063
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	323	329	399	405	317	124	0	0	1,897
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	0.8	0.0	0.0	1.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
ECO E3 - WATER COOLED SCREW

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
1	EQ5011	CONDENSER WATER PUMP-CV (MEDIUM EFFIC.)												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO F - REPLACE BLRS WITH CENTRAL BLRS

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	41731	37678	40796	40536	41264	39600	42199	40796	40536	41263	40536	42199	489,135
	PK	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8	233.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	HOTLD	357	323	357	346	0	0	0	0	0	0	346	357	2,085
	PK	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5
1		HIGH EFFICIENCY MODULAR FIRETUBE BOIL.												
	GAS	967	749	390	378	0	0	0	0	0	0	378	467	3,328
	PK	4.3	4.3	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.2	4.3
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	5580	5040	5580	5400	0	0	0	0	0	0	5400	5580	32,580
	PK	7.5	7.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5	7.5
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## 01 Card - Job Information

Project: 03-0185.06 EEAP BOILER-CHILLER STUDY  
 Location: FORT SAM HOUSTON, TEXAS  
 Client: CORPS OF ENGINEERS - FORT WORTH, TEXAS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: AREA 1000-BLDGS 1000, 1001, 1029, 1088

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	EXISTING CONDITIONS

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	5	1001 LIB-EMT	95.5	95.5	8	2	2.54	11.5			
10	10	1001 CLINIC	151.5	152	8	2	2.54	11.5			
15	15	BLDG 1029	196	196	8	2	2.54	12			
20	20	1000 SURGERY	154.5	154.5	8	2	2.54	13.1			
25	25	1000 ANCILLARY	149	149	8	2	2.54	13.1			
30	30	1000 NURSING	265	265.5	8	2	2.54	13.1			
35	35	1000 ADMIN	233.5	234	8	2	2.54	13.1			
40	40	1000 DINING	53	53	8	2	2.54	13.1			
45	45	1000 COMPUT RM	26.5	27	8	2	2.54	13.1			

## Card 21----- Thermostat Parameters -----

Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	78	50	78		70	70			LIGHT30	YES

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag		Average	Floor
10	78	50	78		70	70				LIGHT30	YES
15	78	50	78		70	70				LIGHT30	YES
20	68	55	68		68	68				HEAVY130	NO
25	72	50	72		72	72				HEAVY130	NO
30	76	50	76		76	76				HEAVY130	NO
35	78	50	78		70	70				HEAVY130	YES
40	78	50	78		70	70				HEAVY130	NO
45	72	50	72		72	72				HEAVY130	NO

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	67	21	0.12	12		80	
10	1	NO	90	90	0.12	12		80	
15	1	NO	98	98	0.12	12			
20	1	NO	95.5	95.5	0.10	12			
25	1	NO	48.5	49	0.10	12			
30	1	NO	123.5	124	0.10	12			
35	1	NO	67	67	0.10	12			
40	1	NO	28	28.5	0.10	12			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	1	98	11.5	0.11	64	20				
5	2	44	11.5	0.11	64	110				
5	3	98	11.5	0.11	64	200				
5	4	124	11.5	0.11	64	290				
10	1	189	11.5	0.11	64	20				
10	2	597	11.5	0.11	64	110				
10	3	152	11.5	0.11	64	200				
10	4	599	11.5	0.11	64	290				
15	1	213	12	0.18	64	330				
15	2	512	12	0.18	64	60				
15	3	213	12	0.18	64	150				
15	4	918	12	0.18	64	240				
20	1	337	13.1	0.18	64	0				
20	2	231	13.1	0.18	64	90				
20	3	185	13.1	0.18	64	180				
20	4	215	13.1	0.18	64	270				
25	1	308	13.1	0.18	64	0				

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
25	2	190	13.1	0.18	64	90			
25	3	262	13.1	0.18	64	180			
25	4	203	13.1	0.18	64	270			
30	1	1226	13.1	0.18	64	0			
30	2	414	13.1	0.18	64	90			
30	3	1338	13.1	0.18	64	180			
30	4	492	13.1	0.18	64	270			
35	1	531	13.1	0.18	64	0			
35	2	247	13.1	0.18	64	90			
35	3	1065	13.1	0.18	64	180			
35	4	319	13.1	0.18	64	270			
40	1	38	13.1	0.18	64	0			
40	2	74	13.1	0.18	64	90			
40	3	38	13.1	0.18	64	180			
45	1	40	13.1	0.18	64	0			
45	2	18	13.1	0.18	64	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Visible Transmittance	Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible		
5	1	6.5	3	4	1.1	1						
5	2	6.5	3	2	1.1	1						
5	3	6.5	3	3	1.1	1						
5	4	6.5	3	7	1.1	1						
10	1	6.5	3	15	1.1	1						
10	2	6.5	3	53	1.1	1						
10	3	6.5	3	10	1.1	1						
10	4	6.5	3	58	1.1	1						
15	1	6.5	3.5	17	1.1	1						
15	2	6.5	3.5	41	1.1	1						
15	3	6.5	3.5	22	1.1	1						
15	4	6.5	3.5	81	1.1	1						
20	1	8	4	33	1.1	0.67						
20	2	8	4	28	1.1	0.67						
20	3	8	4	18	1.1	0.67						
20	4	8	4	18	1.1	0.67						
25	1	8	4	30.5	1.1	0.67						
25	2	8	4	18	1.1	0.67						
25	3	8	4	29	1.1	0.67						
25	4	8	4	16	1.1	0.67						
30	1	8	4	118	1.1	0.67						
30	2	8	4	38	1.1	0.67						
30	3	8	4	158	1.1	0.67						
30	4	8	4	42	1.1	0.67						

Card 25----- Wall/Glass Parameters -----												
Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading		Internal Shading	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value		Type	Type		Solar to Ret. Air	Visible Transmittance	
35	1	8	4	51	1.1	0.67						
35	2	8	4	22	1.1	0.67						
35	3	8	4	121	1.1	0.67						
35	4	8	4	33	1.1	0.67						
40	1	8	4	4	1.1	0.67						
40	2	8	4	7	1.1	0.67						
40	3	8	4	1	1.1	0.67						
45	1	8	4	4	1.1	0.67						
45	2	8	4	2	1.1	0.67						

Card 26----- Schedules -----											
Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls	
5	FSHLIB	AVAIL									
10	FSHOFFIC	FSHOFFIC									
15	FSHOFFIC	FSHOFFIC									
20	AVAIL	AVAIL									
25	AVAIL	AVAIL									
30	AVAIL	AVAIL									
35	AVAIL	AVAIL									
40	FSHDINP	FSHDINL									
45	AVAIL	AVAIL									

Card 27----- People and Lights -----												
Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture		Ballast Factor	Percent Lights to Ret. Air		--- Daylighting --- Reference Point 1    Reference Point 2
							Type	ASHRAE2				
5	12	PEOPLE	250	200	2.1	WATT-SF	ASHRAE2					
10	77	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
15	100	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2					
20	418	SF-PERS	250	200	2.3	WATT-SF	ASHRAE2					
25	418	SF-PERS	250	200	2.5	WATT-SF	ASHRAE2					
30	418	SF-PERS	250	200	1.3	WATT-SF	ASHRAE2					
35	418	SF-PERS	250	200	1.8	WATT-SF	ASHRAE2					
40	418	SF-PERS	250	200	1.2	WATT-SF	ASHRAE2					
45	1	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					

Card 28----- Miscellaneous Equipment -----												
Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path	
	Number	Descrip										
5	1	OFFICE EQ	1.3	WATT-SF	AVAIL	NONE						



Card 28----- Miscellaneous Equipment -----											
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent			
Number	Equipment	Descrip	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number		Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
10	1	OFFICE EQ	1.9	WATT-SF	FSHOFFIC	NONE					
15	1	OFFICE EQ	2.3	WATT-SF	FSHOFFIC	NONE					
20	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
25	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
30	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
35	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
40	1	DINING EQ	1	WATT-SF	FSHDINL	NONE					
45	1	COMPUTER RM EQ	4.0	WATT-SF	AVAIL	NONE					

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	0.307	CFM-SF	0.307	CFM-SF						
25	0.307	CFM-SF	0.307	CFM-SF						
30	0.307	CFM-SF	0.307	CFM-SF						
35	0.307	CFM-SF	0.307	CFM-SF						
40	0.307	CFM-SF	0.307	CFM-SF						
45	0.307	CFM-SF	0.307	CFM-SF						

Card 31----- Partition Parameters -----										
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No	
15	1	459	12	0.29	110	HRLYOADB				
20	1	70	13.1	0.34	110	HRLYOADB				
35	1	70	12	0.18	110	HRLYOADB				

----- System Section Alternative #1 -----

Card 39- System Alternative	
Number	Description
1	EXISTING AIRSIDE EQUIPMENT



## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
3	58.3	58.3								
4	58.3	58.3								
6	63	63								

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --		-- Control Type --		-- Exh-Side Deck --	
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
4	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main	Auxiliary			
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating	
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil	
1									FTSAMHTG	
2									FTSAMHTG	
3									FTSAMHTG	
4									FTSAMHTG	
5									FTSAMHTG	
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

## Card 49----- Heating Capacity Overrides -----

System	---MAIN HEATING---		-----PREHEAT-----		-----REHEAT-----		--HUMIDIFICATION--		---AUX HEATING---	
Set	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
1									48.9	MBH
2									49.7	MBH
3									203	MBH
4									113.0	MBH
5									6.5	MBH

----- Equipment Section Alternative #1 -----



## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Energy Rate	Seq Order	Switch over	Hot Strg	Misc. Acc.	Cogen	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control
1	BLR2MOD	1	18.6	KW	4230	MBH	5500	MBH	1	
2	BLR2MOD	1	18.6	KW	4230	MBH	5500	MBH	2	
3	STEAMBLR	1			3072	MBH	5223	MBH		
4	STEAMBLR	1			761.9	MBH	1050	MBH		
5	BOILERWT	1	2.2	KW	1887	MBH	2500	MBH		

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

System Set Number	---MAIN SYSTEM---				--OTHER SYSTEM--			---DEMAND LIMIT PRIORITY---				
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh Fan	Opt Vent Fan
Number	KW	KW	KW	KW	KW	KW	KW					
1	20.1											
2	13.0											
3	20.5											
4	29.8											
5	5.6											
6	2.2											
7	3.7											
8	16.8											
9	17.2											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	DISTR LOSSES	25.5	TONS	AVAIL	CHILL-LD	1			

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
2	DISTR LOSSES	10.6	TONS	AVAIL	CHILL-LD	2			
3	DISTR LOSSES	0.2	TONS	AVAIL	CHILL-LD	3			
4	DISTR LOSSES	4.5	TONS	FTSAMCLG	CHILL-LD	4			
5	DISTR LOSSES	7.3	TONS	FTSAMCLG	CHILL-LD	5			
6	DISTR LOSSES	48.5	MBH	AVAIL	HOT-LD	1			
7	DISTR LOSSES	0	MBH	AVAIL	HOT-LD	2			
8	DISTR LOSSES	44	MBH	FTSAMHTG	HOT-LD	3			
9	DISTR LOSSES	13.0	MBH	FTSAMHTG	HOT-LD	4			
10	DISTR LOSSES	12.6	MBH	FTSAMHTG	HOT-LD	5			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow	Low Spd Energy Value	Low Spd Energy Units
1	EQ5100			11.2	KW	T-WATER	CTOWER	1			
2	EQ5100			7.46	KW	T-WATER	CTOWER	1	50	4.36	KW
3	EQ5100			18.6	KW	T-WATER	CTOWER	1			
4	EQ5100			18.6	KW	T-WATER	CTOWER	1			

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO G-INSTALL EMS FOR HVAC EQUIPMENT

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	5	1001 LIB-EMT	95.5	95.5	8	2	2.54	11.5			
10	10	1001 CLINIC	151.5	152	8	2	2.54	11.5			
15	15	BLDG 1029	196	196	8	2	2.54	12			
20	20	1000 SURGERY	154.5	154.5	8	2	2.54	13.1			
25	25	1000 ANCILLARY	149	149	8	2	2.54	13.1			
30	30	1000 NURSING	265	265.5	8	2	2.54	13.1			
35	35	1000 ADMIN	233.5	234	8	2	2.54	13.1			
40	40	1000 DINING	53	53	8	2	2.54	13.1			
45	45	1000 COMPUT RM	26.5	27	8	2	2.54	13.1			

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	78	50	78		70	70			LIGHT30	YES
10	78	50	78		70	70			LIGHT30	YES
15	78	50	78		70	70			LIGHT30	YES
20	68	55	68		68	68			HEAVY130	NO
25	72	50	72		72	72			HEAVY130	NO
30	76	50	76		76	76			HEAVY130	NO
35	78	50	78		70	70			HEAVY130	YES
40	78	50	78		70	70			HEAVY130	NO
45	72	50	72		72	72			HEAVY130	NO

## Card 22----- Roof Parameters -----

Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	67	21	0.12	12		80	
10	1	NO	90	90	0.12	12		80	
15	1	NO	98	98	0.12	12			
20	1	NO	95.5	95.5	0.10	12			
25	1	NO	48.5	49	0.10	12			
30	1	NO	123.5	124	0.10	12			
35	1	NO	67	67	0.10	12			
40	1	NO	28	28.5	0.10	12			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	1	98	11.5	0.11	64	20				
5	2	44	11.5	0.11	64	110				
5	3	98	11.5	0.11	64	200				
5	4	124	11.5	0.11	64	290				
10	1	189	11.5	0.11	64	20				
10	2	597	11.5	0.11	64	110				
10	3	152	11.5	0.11	64	200				
10	4	599	11.5	0.11	64	290				
15	1	213	12	0.18	64	330				
15	2	512	12	0.18	64	60				
15	3	213	12	0.18	64	150				
15	4	918	12	0.18	64	240				
20	1	337	13.1	0.18	64	0				
20	2	231	13.1	0.18	64	90				
20	3	185	13.1	0.18	64	180				
20	4	215	13.1	0.18	64	270				
25	1	308	13.1	0.18	64	0				

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
25	2	190	13.1	0.18	64	90			
25	3	262	13.1	0.18	64	180			
25	4	203	13.1	0.18	64	270			
30	1	1226	13.1	0.18	64	0			
30	2	414	13.1	0.18	64	90			
30	3	1338	13.1	0.18	64	180			
30	4	492	13.1	0.18	64	270			
35	1	531	13.1	0.18	64	0			
35	2	247	13.1	0.18	64	90			
35	3	1065	13.1	0.18	64	180			
35	4	319	13.1	0.18	64	270			
40	1	38	13.1	0.18	64	0			
40	2	74	13.1	0.18	64	90			
40	3	38	13.1	0.18	64	180			
45	1	40	13.1	0.18	64	0			
45	2	18	13.1	0.18	64	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External	Internal	Percent	Visible Transmittance	Inside
							Shading Type	Shading Type	Solar to Ret. Air		Visible Reflectance
5	1	6.5	3	4	1.1	1					
5	2	6.5	3	2	1.1	1					
5	3	6.5	3	3	1.1	1					
5	4	6.5	3	7	1.1	1					
10	1	6.5	3	15	1.1	1					
10	2	6.5	3	53	1.1	1					
10	3	6.5	3	10	1.1	1					
10	4	6.5	3	58	1.1	1					
15	1	6.5	3.5	17	1.1	1					
15	2	6.5	3.5	41	1.1	1					
15	3	6.5	3.5	22	1.1	1					
15	4	6.5	3.5	81	1.1	1					
20	1	8	4	33	1.1	0.67					
20	2	8	4	28	1.1	0.67					
20	3	8	4	18	1.1	0.67					
20	4	8	4	18	1.1	0.67					
25	1	8	4	30.5	1.1	0.67					
25	2	8	4	18	1.1	0.67					
25	3	8	4	29	1.1	0.67					
25	4	8	4	16	1.1	0.67					
30	1	8	4	118	1.1	0.67					
30	2	8	4	38	1.1	0.67					
30	3	8	4	158	1.1	0.67					
30	4	8	4	42	1.1	0.67					



## Card 25----- Wall/Glass Parameters -----

Room	Wall	Glass	Glass	Pct Glass			External	Internal	Percent		Inside
Number	Number	Length	Width	or No. of	Glass	Shading	Shading	Shading	Solar to	Visible	Visible
				Windows	U-Value	Coefficient	Type	Type	Ret. Air	Transmittance	Reflectance
35	1	8	4	51	1.1	0.67					
35	2	8	4	22	1.1	0.67					
35	3	8	4	121	1.1	0.67					
35	4	8	4	33	1.1	0.67					
40	1	8	4	4	1.1	0.67					
40	2	8	4	7	1.1	0.67					
40	3	8	4	1	1.1	0.67					
45	1	8	4	4	1.1	0.67					
45	2	8	4	2	1.1	0.67					

## Card 26----- Schedules -----

Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
5	FSHLIB	AVAIL								
10	FSHOFFIC	FSHOFFIC				DAYSCHED				
15	FSHOFFIC	FSHOFFIC				DAYSCHED				
20	AVAIL	AVAIL								
25	AVAIL	AVAIL								
30	AVAIL	AVAIL								
35	AVAIL	AVAIL								
40	FSHDINP	FSHDINL								
45	AVAIL	AVAIL								

## Card 27----- People and Lights -----

Room	People	People	People	People	Lighting	Lighting	Lighting	Percent	--- Daylighting ---	
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1 Reference Point 2
5	12	PEOPLE	250	200	2.1	WATT-SF	ASHRAE2			
10	77	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2			
15	100	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2			
20	418	SF-PERS	250	200	2.3	WATT-SF	ASHRAE2			
25	418	SF-PERS	250	200	2.5	WATT-SF	ASHRAE2			
30	418	SF-PERS	250	200	1.3	WATT-SF	ASHRAE2			
35	418	SF-PERS	250	200	1.8	WATT-SF	ASHRAE2			
40	418	SF-PERS	250	200	1.2	WATT-SF	ASHRAE2			
45	1	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2			

## Card 28----- Miscellaneous Equipment -----

Room	Misc		Energy	Energy	Energy	Percent	Percent	Percent			
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
5	1	OFFICE EQ	1.3	WATT-SF	AVAIL	NONE					

Card 28----- Miscellaneous Equipment -----											
Room	Misc	Equipment	Energy	Energy	Schedule	Energy	Percent	Percent	Percent		
Number	Equipment	Equipment	Consump	Consump	Code	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number	Descrip	Value	Units		Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
10	1	OFFICE EQ	1.9	WATT-SF	FSHOFFIC	NONE					
15	1	OFFICE EQ	2.3	WATT-SF	FSHOFFIC	NONE					
20	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
25	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
30	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
35	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
40	1	DINING EQ	1	WATT-SF	FSHDINL	NONE					
45	1	COMPUTER RM EQ	4.0	WATT-SF	AVAIL	NONE					

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	0.307	CFM-SF	0.307	CFM-SF						
25	0.307	CFM-SF	0.307	CFM-SF						
30	0.307	CFM-SF	0.307	CFM-SF						
35	0.307	CFM-SF	0.307	CFM-SF						
40	0.307	CFM-SF	0.307	CFM-SF						
45	0.307	CFM-SF	0.307	CFM-SF						

Card 31----- Partition Parameters -----										
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No	
15	1	459	12	0.29	110	HRLYOADB				
20	1	70	13.1	0.34	110	HRLYOADB				
35	1	70	12	0.18	110	HRLYOADB				

----- System Section Alternative #2 -----

## Card 39- System Alternative

Number	Description
2	ECO G-INSTALL EMS AIRSIDE SYSTEMS



## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec	
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff	
3	58.3	58.3									
4	58.3	58.3									
6	63	63									

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage		Exhaust Air Heat Recovery					
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --		-- Control Type --		-- Exh-Side Deck --	
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
4	DRY-BULB	65	100										
7	DRY-BULB	65	100										
8	DRY-BULB	65	100										
9	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main				Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating	
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil	
1											FTSAMHTG
2											FTSAMHTG
3											FTSAMHTG
4											FTSAMHTG
5											FTSAMHTG
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG			
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG			
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG			

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
8			OPSTART	OPSTOP					
9			OPSTART	OPSTOP					

## Card 49----- Heating Capacity Overrides -----

System	---MAIN HEATING---		---PREHEAT---		---REHEAT---		---HUMIDIFICATION---		---AUX HEATING---	
Set	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
1									48.9	MBH

Card 49----- Heating Capacity Overrides -----

System	---MAIN HEATING---		-----PREHEAT-----		-----REHEAT-----		--HUMIDIFICATION--		---AUX HEATING---	
Set	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
2									49.7	MBH
3									203	MBH
4									113.0	MBH
5									6.5	MBH

----- Equipment Section Alternative #2 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Temperature
Number	Time of Day	Time of Day	Limit	Schedule
Number	Schedule	Schedule	Max KW	Alternative Description
2				ECO G-INSTALL EMS WATERSIDE SYSTEMS

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	6								
2	3		7	8								
3	5		9	9								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1001S	1	400	TONS	252	KW					1	PAR	
2	EQ1001S	1	400	TONS	277	KW					2	PAR	
3	EQ1307	1	6	TONS	7.6	KW					1	PAR	
4	EQ1001S	1	90	TONS	0.95	KW-TON					2	PAR	
5	EQ1008S	1	160	TONS	100	KW							

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		-----CONDENSER-----		---HT REC or AUX---		Switch-				
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.	
1	37.3	KW	29.8	KW					3		

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX----	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
2	37.3	KW	29.8	KW					4	
4	11.2	KW	11.2	KW					1	
5	18.6	KW	18.6	KW					2	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1	10					85	55	
2	10					85	55	
5	10					85	55	

## Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	6								
2	4	7	8								
3	5	9	9								

## Card 66----- Optional Heating Coil Assignment -----

Load							Misc.
Assignment	Main	Preheat	Reheat	Mech	Aux	Optional	Heating
Reference	Coil	Coil	Coil	Humidif	Coil	Ventil	Load
1					3		

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp		Energy	Seq	Switch						
Ref	Code	Of	Full Ld		Cap'y	Rate	Order	over	Hot	Misc.		Demand	
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen
1	BLR2MOD	1	18.6	KW	4230	MBH	5500	MBH	1				
2	BLR2MOD	1	18.6	KW	4230	MBH	5500	MBH	2				
3	STEAMBLR	1			3072	MBH	5223	MBH					
4	STEAMBLR	1			761.9	MBH	1050	MBH					
5	BOILERWT	1	2.2	KW	1887	MBH	2500	MBH					

## Card 69----- Fan Equipment Parameters -----

## System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

System Set Number	-----MAIN SYSTEM-----			--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----					
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
1	20.1											
2	13.0											
3	20.5											
4	29.8											
5	5.6											
6	2.2											
7	3.7											
8	16.8											
9	17.2											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	DISTR LOSSES	25.5	TONS	AVAIL	CHILL-LD	1			
2	DISTR LOSSES	10.6	TONS	AVAIL	CHILL-LD	2			
3	DISTR LOSSES	0.2	TONS	AVAIL	CHILL-LD	3			
4	DISTR LOSSES	4.5	TONS	FTSAMCLG	CHILL-LD	4			
5	DISTR LOSSES	7.3	TONS	FTSAMCLG	CHILL-LD	5			
6	DISTR LOSSES	48.5	MBH	AVAIL	HOT-LD	1			
7	DISTR LOSSES	0	MBH	AVAIL	HOT-LD	2			
8	DISTR LOSSES	44	MBH	FTSAMHTG	HOT-LD	3			
9	DISTR LOSSES	13.0	MBH	FTSAMHTG	HOT-LD	4			
10	DISTR LOSSES	12.6	MBH	FTSAMHTG	HOT-LD	5			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	EQ5100			11.2	KW	T-WATER	CTOWER	1			

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling		Energy		Energy		Number		Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
2	EQ5100			7.46	KW	T-WATER	CTOWER	1	50	4.36
3	EQ5100			18.6	KW	T-WATER	CTOWER	1		
4	EQ5100			18.6	KW	T-WATER	CTOWER	1		

----- Load Section Alternative #3 -----

Card 19- Load Alternative -

Number	Description
3	ECO H1 - EXISTING BUILDINGS

Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	5	1001 LIB-EMT	95.5	95.5	8	2	2.54	11.5			
10	10	1001 CLINIC	151.5	152	8	2	2.54	11.5			
15	15	BLDG 1029	196	196	8	2	2.54	12			
20	20	1000 SURGERY	154.5	154.5	8	2	2.54	13.1			
25	25	1000 ANCILLARY	149	149	8	2	2.54	13.1			
30	30	1000 NURSING	265	265.5	8	2	2.54	13.1			
35	35	1000 ADMIN	233.5	234	8	2	2.54	13.1			
40	40	1000 DINING	53	53	8	2	2.54	13.1			
45	45	1000 COMPUT RM	26.5	27	8	2	2.54	13.1			

Card 21----- Thermostat Parameters -----

Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	78	50	78		70	70			LIGHT30	YES
10	78	50	78		70	70			LIGHT30	YES
15	78	50	78		70	70			LIGHT30	YES
20	68	55	68		68	68			HEAVY130	NO
25	72	50	72		72	72			HEAVY130	NO
30	76	50	76		76	76			HEAVY130	NO
35	78	50	78		70	70			HEAVY130	YES
40	78	50	78		70	70			HEAVY130	NO
45	72	50	72		72	72			HEAVY130	NO



## Card 22----- Roof Parameters -----

Roof									
Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	67	21	0.12	12		80	
10	1	NO	90	90	0.12	12		80	
15	1	NO	98	98	0.12	12			
20	1	NO	95.5	95.5	0.10	12			
25	1	NO	48.5	49	0.10	12			
30	1	NO	123.5	124	0.10	12			
35	1	NO	67	67	0.10	12			
40	1	NO	28	28.5	0.10	12			

## Card 24----- Wall Parameters -----

Wall									
Wall									Ground
Room	Wall	Wall	Wall	Wall	Constuc	Wall	Wall	Wall	Reflectance
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Multiplier
5	1	98	11.5	0.11	64	20			
5	2	44	11.5	0.11	64	110			
5	3	98	11.5	0.11	64	200			
5	4	124	11.5	0.11	64	290			
10	1	189	11.5	0.11	64	20			
10	2	597	11.5	0.11	64	110			
10	3	152	11.5	0.11	64	200			
10	4	599	11.5	0.11	64	290			
15	1	213	12	0.18	64	330			
15	2	512	12	0.18	64	60			
15	3	213	12	0.18	64	150			
15	4	918	12	0.18	64	240			
20	1	337	13.1	0.18	64	0			
20	2	231	13.1	0.18	64	90			
20	3	185	13.1	0.18	64	180			
20	4	215	13.1	0.18	64	270			
25	1	308	13.1	0.18	64	0			
25	2	190	13.1	0.18	64	90			
25	3	262	13.1	0.18	64	180			
25	4	203	13.1	0.18	64	270			
30	1	1226	13.1	0.18	64	0			
30	2	414	13.1	0.18	64	90			
30	3	1338	13.1	0.18	64	180			
30	4	492	13.1	0.18	64	270			
35	1	531	13.1	0.18	64	0			
35	2	247	13.1	0.18	64	90			
35	3	1065	13.1	0.18	64	180			
35	4	319	13.1	0.18	64	270			
40	1	38	13.1	0.18	64	0			
40	2	74	13.1	0.18	64	90			
40	3	38	13.1	0.18	64	180			
45	1	40	13.1	0.18	64	0			
45	2	18	13.1	0.18	64	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
5	1	6.5	3	4	1.1	1					
5	2	6.5	3	2	1.1	1					
5	3	6.5	3	3	1.1	1					
5	4	6.5	3	7	1.1	1					
10	1	6.5	3	15	1.1	1					
10	2	6.5	3	53	1.1	1					
10	3	6.5	3	10	1.1	1					
10	4	6.5	3	58	1.1	1					
15	1	6.5	3.5	17	1.1	1					
15	2	6.5	3.5	41	1.1	1					
15	3	6.5	3.5	22	1.1	1					
15	4	6.5	3.5	81	1.1	1					
20	1	8	4	33	1.1	0.67					
20	2	8	4	28	1.1	0.67					
20	3	8	4	18	1.1	0.67					
20	4	8	4	18	1.1	0.67					
25	1	8	4	30.5	1.1	0.67					
25	2	8	4	18	1.1	0.67					
25	3	8	4	29	1.1	0.67					
25	4	8	4	16	1.1	0.67					
30	1	8	4	118	1.1	0.67					
30	2	8	4	38	1.1	0.67					
30	3	8	4	158	1.1	0.67					
30	4	8	4	42	1.1	0.67					
35	1	8	4	51	1.1	0.67					
35	2	8	4	22	1.1	0.67					
35	3	8	4	121	1.1	0.67					
35	4	8	4	33	1.1	0.67					
40	1	8	4	4	1.1	0.67					
40	2	8	4	7	1.1	0.67					
40	3	8	4	1	1.1	0.67					
45	1	8	4	4	1.1	0.67					
45	2	8	4	2	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHLIB	AVAIL								
10	FSHOFFIC	FSHOFFIC								
15	FSHOFFIC	FSHOFFIC								
20	AVAIL	AVAIL								
25	AVAIL	AVAIL								
30	AVAIL	AVAIL								
35	AVAIL	AVAIL								
40	FSHDINP	FSHDINL								
45	AVAIL	AVAIL								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	Percent --- Daylighting --- Reference Point 1	Percent --- Daylighting --- Reference Point 2
5	12	PEOPLE	250	200	2.1	WATT-SF	ASHRAE2				
10	77	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2				
15	100	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2				
20	418	SF-PERS	250	200	2.3	WATT-SF	ASHRAE2				
25	418	SF-PERS	250	200	2.5	WATT-SF	ASHRAE2				
30	418	SF-PERS	250	200	1.3	WATT-SF	ASHRAE2				
35	418	SF-PERS	250	200	1.8	WATT-SF	ASHRAE2				
40	418	SF-PERS	250	200	1.2	WATT-SF	ASHRAE2				
45	1	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Misc Equipment Descrip	Energy Consump Value	Energy Consump Units	Energy Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Percent Radiant Fraction	Optional Air Path
5	1	OFFICE EQ	1.3	WATT-SF	AVAIL	NONE					
10	1	OFFICE EQ	1.9	WATT-SF	FSHOFFIC	NONE					
15	1	OFFICE EQ	2.3	WATT-SF	FSHOFFIC	NONE					
20	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
25	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
30	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
35	1	HOSPITAL EQ	4.0	WATT-SF	AVAIL	NONE					
40	1	DINING EQ	1	WATT-SF	FSHDINL	NONE					
45	1	COMPUTER RM EQ	4.0	WATT-SF	AVAIL	NONE					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----		-----Infiltration-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	0.307	CFM-SF	0.307	CFM-SF						
25	0.307	CFM-SF	0.307	CFM-SF						
30	0.307	CFM-SF	0.307	CFM-SF						
35	0.307	CFM-SF	0.307	CFM-SF						
40	0.307	CFM-SF	0.307	CFM-SF						
45	0.307	CFM-SF	0.307	CFM-SF						

## Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Partition Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
15	1	459	12	0.29	110	HRLYOADB			

Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
20	1	70	13.1	0.34	110	HRLYOADB			
35	1	70	12	0.18	110	HRLYOADB			

----- System Section Alternative #3 -----

## Card 39- System Alternative

Number	Description
3	ECO H - AIRSIDE EQUIPMENT

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System Set	System Type	Ventil Deck	Cooling SADBvh	Heating SADBvh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	TRH-AUX						
2	TRH-AUX						
3	TRH-AUX						
4	TRH-AUX						
5	TRH-AUX						
6	FC						
7	BPMZ						
8	BPMZ						
9	BPMZ						

Card 41----- Zone Assignment -----

System Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	20	20										
2	25	25										
3	30	30										
4	35	35										
5	40	40										
6	45	45										
7	5	5										
8	10	10										
9	15	15										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.0										
2	1.0										
3	1.0										
4	1.0										
5	1.0										
6	1.0										
7	1.0										
8	1.0										
9	1.0										

## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec	
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff	
1	55.7	55.7									
2	58.1	58.1									
3	58.3	58.3									
4	58.3	58.3									
6	63	63									

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----							
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --				
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	
1	DRY-BULB	65	100											
2	DRY-BULB	65	100											
3	DRY-BULB	65	100											
4	DRY-BULB	65	100											

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main	Auxiliary			
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating	
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil	
1									FTSAMHTG	
2									FTSAMHTG	
3									FTSAMHTG	
4									FTSAMHTG	
5									FTSAMHTG	
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

Card 49----- Heating Capacity Overrides -----

System	---MAIN HEATING---		-----PREHEAT-----		-----REHEAT-----		--HUMIDIFICATION--		---AUX HEATING---	
Set	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
1									48.9	MBH
2									49.7	MBH
3									203	MBH
4									113.0	MBH
5									6.5	MBH

----- Equipment Section Alternative #3 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	----- Demand Limit -----		
Number	Time of Day	Time of Day	Limit	Temperature		
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
3				ECO H1 - WATERSIDE EQUIPMENT		

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	9										

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand				
Ref	Code	Of	--Capacity--	Value	Units	Value	Units	Value	Units	Value	Units	Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008S	1	235	TONS	141	KW							1	PAR	
2	EQ1001S	1	380	TONS	260	KW							2	PAR	
3	EQ1001S	1	380	TONS	286	KW							3	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		-----CONDENSER-----		---HT REC or AUX---		Switch-			
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	14.9	KW	11.2	KW					1	
2	37.3	KW	29.8	KW					2	
3	37.3	KW	29.8	KW					3	

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp

1      DISTR LOSSES      48.1      TONS      FTSAMCLG CHILL-LD 1

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
2	DISTRIBUTION LOS	41.0	TONS	FTSAMHTG	CHILL-LD	1			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy		Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
				Consump Value	Consump Units						
1	EQ5100			11.2	KW	T-WATER	CTOWER	1			
2	EQ5100			18.6	KW	T-WATER	CTOWER	1			
3	EQ5100			18.6	KW	T-WATER	CTOWER	1			

## ----- Equipment Section Alternative #4 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Time of Day Schedule	Elec Consump Schedule	Elec Demand Max KW	Demand Limit Limit	Alternative Description	Temperature Schedule	Demand Limit Drift

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	9										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip Ref Code	Num Of	--COOLING--				--HEAT RECOVERY--				Seq Order	Demand Seq Limit	
		--Capacity-- Value	--Capacity-- Units	--Energy-- Value	--Energy-- Units	--Capacity-- Value	--Capacity-- Units	--Energy-- Value	--Energy-- Units			
1	EQ1009	1	235	TONS	141	KW					1	PAR
2	EQ1001S	1	380	TONS	260	KW					2	PAR
3	EQ1001S	1	380	TONS	286	KW					3	PAR

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	14.9	KW	11.2	KW





## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Time of Day Schedule	Elec Consump	Elec Demand	Demand Limit	Temperature	Drift
1						

ECO H3 - WATERSIDE EQUIPMENT

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1		1	9										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	COOLING				HEAT RECOVERY				Seq	Demand
		Ref	Code	Of	--Capacity--	Value	Units	Value	Units		
1	YSCRW22	1		235	TONS	146	KW			1	PAR
2	EQ1001S	1		380	TONS	260	KW			2	PAR
3	EQ1001S	1		380	TONS	286	KW			3	PAR

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	14.9	KW	11.2	KW
2	37.3	KW	29.8	KW
3	37.3	KW	29.8	KW

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand
Utility	Utility	Demand	Demand	Reference	Limiting
Number	Descrip	Value	Units	Code	Type
1	DISTR LOSSES	48.1	TONS	FTSAMCLG	CHILL-LD 1
2	DISTRIBUTION LOS	41.0	TONS	FTSAMHTG	CHILL-LD 1

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Tower	Capacity	Capacity	Energy	Energy	Fluid	Tower	Number	Percent	Low Spd	Low Spd	
												Ref
1	EQ5100			11.2	KW	T-WATER	CTOWER	1				
2	EQ5100			18.6	KW	T-WATER	CTOWER	1				
3	EQ5100			18.6	KW	T-WATER	CTOWER	1				

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description	----- Demand Limit --- Temperature Schedule	Drift
2				ECO H4 - WATERSIDE EQUIPMENT		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	9										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----	-----HEAT RECOVERY-----	Seq	Demand		
Ref	Code	Of	--Capacity--	---Energy---	Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value
1	EDC80TON	1	500	TONS	3284	MBH	1
2	EDC80TON	1	500	TONS	3284	MBH	2

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	29.8	KW	22.4	KW
2	29.8	KW	22.4	KW

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand
Utility	Utility	Demand	Demand	Reference	Limiting
Number	Descrip	Value	Units	Code	Type
1	DISTR LOSSES	48.1	TONS	FTSAMCLG	CHILL-LD
2	DISTRIBUTION LOS	41.0	TONS	FTSAMHTG	CHILL-LD

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd
Tower	Consump	Consump	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Type	Type	Cells
1	EQ5100	18.6	KW	T-WATER	CTOWER	1
2	EQ5100	18.6	KW	T-WATER	CTOWER	1



Utility Description Reference Table  
-----

## Schedules:

AVAIL AVAILABLE (100%)  
DAYSCHED COOLING FAN SCHEDULE CODE  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSHLIB F.S.H. LIBRARY PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE

## System:

BPMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
TRH-AUX TERMINAL REHEAT SYSTEM WITH AUX HTG

## Equipment:

## Cooling:

EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS  
EQ1008S 3-STG CENTRIFUGAL < 300 TONS  
EQ1009 3-STG CTV WITH VARIABLE FREQUENCY DRV  
EQ1307 PACKAGED TERMINAL AIR CONDITIONER

## Heating:

BLR2MOD WATERTUBE BOILER WITH HIGH-LOW FIRE  
BOILERWT WATERTUBE BOILER  
STEAMBLR STEAM BOILER

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS

Schedule Name: AVAIL

Project: AVAILABLE (100)

Location:

Client: VERSION 3.0

Program User: C.D.S. MARKETING

Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0	0
6	100
17	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
12	100
16	0
24	

Schedule Name: FSHDINL  
Project: F.S.H. BARRACKS DINING LIGHTING  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
5 100  
19 0  
24



Schedule Name: FSHDINP  
Project: F.S.H. BARRACKS DINING PEOPLE S  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
6 100  
9 0  
11 100  
14 0  
17 100  
19 0  
24

Schedule Name: FSHLIB  
Project: F.S.H. LIBRARY PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	15
7	100
17	60
23	15
24	

Schedule Name: FSHOFFIC  
Project: F.S.H. OFFICE INTERNAL LOAD SCH  
Location: F.S.H. SAN ANTONIO, TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC. - JTC,  
Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
12 10  
13 100  
17 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: OPSTART

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0		0
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0		0
6	100	
7		0
24		

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0	0	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0	0	
16	100	
17	0	
24		

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
BWHP1001 SCHEDULE FOR HW PUMP BLDG. 1001  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSLIB F.S.H. LIBRARY PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY

## System:

BPMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
TRH-AUX TERMINAL REHEAT SYSTEM WITH AUX HTG

## Equipment:

## Cooling:

EDC80TON ENGINE DRIVEN CHILLER, 80 TONS  
EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS  
YSCRW22 YORK W.C. SCREW CHILLER

## Heating:

BLRFLMOD WATERTUBE BOILER WITH FULL MODULATION  
STEAMBLR STEAM BOILER

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5020 HEATING WATER CIRCULATION PUMP



```
*****  
*****  
**  
**          T R A C E    6 0 0    A N A L Y S I S          **  
**  
**          by  HUITT & ZOLLARS          **  
**  
*****  
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FORT SAM HOUSTON, TEXAS  
CORPS OF ENGINEERS - FORT WORTH, TEXAS  
HUITT-ZOLLARS, INC.  
AREA 1000-BLDGS 1000, 1001, 1029, 1088

Weather File Code:

Location:	SAN ANTONIO, TEXAS	
Latitude:	29.0	(deg)
Longitude:	98.0	(deg)
Time Zone:	6	
Elevation:	792	(ft)
Barometric Pressure:	29.0	(in. Hg)
Summer Clearness Number:	0.90	
Winter Clearness Number:	0.90	
Summer Design Dry Bulb:	97	(F)
Summer Design Wet Bulb:	76	(F)
Winter Design Dry Bulb:	30	(F)
Summer Ground Relectance:	0.20	
Winter Ground Relectance:	0.20	
Air Density:	0.0738	(Lbm/cuft)
Air Specific Heat:	0.2444	(Btu/lbm/F)
Density-Specific Heat Prod:	1.0818	(Btu-min./hr/cuft/F)
Latent Heat Factor:	4,761.9	(Btu-min./hr/cuft)
Enthalpy Factor:	4.4255	(Lb-min./hr/cuft)

Design Simulation Period: June      To November  
System Simulation Period: January    To December  
Cooling Load Methodology:    TETD/Time Averaging

Time/Date Program was Run:    13:12:11    2/24/96  
Dataset Name:                    FSH1000 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
Design	Cap.	Hours	Hours	Capacity	Hours	Hours	Cap.	Hours	Hours	Cap.	Hours	Hours
Load	(Ton)	(%)		(Btuh)	(%)		(Cfm)	(%)		(Cfm)	(%)	
0 - 5	46.8	31	2,677	-533,097	17	1,472	21,958.3	0	0	0.0	0	0
5 - 10	93.7	3	276	-1,066,194	37	3,236	43,916.7	0	0	0.0	0	0
10 - 15	140.5	4	338	-1,599,291	30	2,638	65,875.0	0	0	0.0	0	0
15 - 20	187.4	2	153	-2,132,387	14	1,245	87,833.4	0	0	0.0	0	0
20 - 25	234.2	1	122	-2,665,484	2	169	109,791.7	0	0	0.0	0	0
25 - 30	281.0	0	30	-3,198,581	0	0	131,750.1	0	0	0.0	0	0
30 - 35	327.9	0	0	-3,731,678	0	0	153,708.4	0	0	0.0	0	0
35 - 40	374.7	1	90	-4,264,775	0	0	175,666.7	0	0	0.0	0	0
40 - 45	421.6	6	486	-4,797,872	0	0	197,625.1	0	0	0.0	0	0
45 - 50	468.4	3	282	-5,330,969	0	0	219,583.4	0	0	0.0	0	0
50 - 55	515.2	8	698	-5,864,066	0	0	241,541.8	0	0	0.0	0	0
55 - 60	562.1	5	406	-6,397,163	0	0	263,500.1	0	0	0.0	0	0
60 - 65	608.9	6	491	-6,930,259	0	0	285,458.4	0	0	0.0	0	0
65 - 70	655.8	6	559	-7,463,356	0	0	307,416.8	0	0	0.0	0	0
70 - 75	702.6	9	775	-7,996,454	0	0	329,375.1	0	0	0.0	0	0
75 - 80	749.4	10	833	-8,529,551	0	0	351,333.5	0	0	0.0	0	0
80 - 85	796.3	5	416	-9,062,647	0	0	373,291.8	0	0	0.0	0	0
85 - 90	843.1	1	128	-9,595,744	0	0	395,250.2	0	0	0.0	0	0
90 - 95	890.0	0	0	-10,128,841	0	0	417,208.5	0	0	0.0	0	0
95 - 100	936.8	0	0	-10,661,938	0	0	439,166.8	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	260391	235223	262320	251681	261356	253609	259427	262320	251681	261356	251681	259427	3,070,472
	PK	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	18972	17136	18972	18360	18972	18360	18972	18972	18360	18972	18360	18972	223,380
	PK	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
2		BASE UTILITY												
	CHILLD	7886	7123	7886	7632	7886	7632	7886	7886	7632	7886	7632	7886	92,856
	PK	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
3		BASE UTILITY												
	CHILLD	149	134	149	144	149	144	149	149	144	149	144	149	1,752
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
4		BASE UTILITY												
	CHILLD	0	0	0	0	3348	3240	3348	3348	3240	3348	0	0	19,872
	PK	0.0	0.0	0.0	0.0	4.5	4.5	4.5	4.5	4.5	4.5	0.0	0.0	4.5

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Bldg. 1000 CHW Equipment (CHLR-2)												
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	32337	66125	126629	136665	153706	160194	138890	50680	32553	0	897,779
	PK	0.0	0.0	120.6	163.1	203.7	233.5	245.4	256.9	227.3	146.9	127.9	0.0	256.9
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	5062	8370	13838	13392	13838	13838	13392	7169	4978	0	93,878
	PK	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	219	427	787	828	912	940	838	336	219	0	5,507
	PK	0.0	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.3	1.0	0.9	0.0	1.4
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	10407	16785	27751	26856	27751	27751	26856	14510	10071	0	188,738
	PK	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	8314	13410	22171	21456	22171	22171	21456	11592	8046	0	150,788
	PK	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	279	450	744	720	744	744	720	389	270	0	5,060
	PK	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
		Bldg. 1001 Window Units												
3	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	160	144	160	156	1626	1706	1972	1989	1502	894	155	160	10,623
	PK	6.4	6.4	6.4	6.7	7.2	7.5	7.7	7.7	7.2	6.7	6.4	6.4	7.7
3	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	11	9	15	18	216	231	303	270	206	108	14	11	1,412
	PK	0.0	0.0	0.0	0.0	0.7	0.8	1.0	1.0	0.7	0.6	0.0	0.0	1.0
3	EQ5308	CONTROLS												
	ELEC	74	67	74	72	74	72	74	74	72	74	72	74	876
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Bldg. 1001 CHW Equipment												
4	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	20371	20908	23463	23990	19625	12976	0	0	121,332
	PK	0.0	0.0	0.0	0.0	60.1	61.2	63.8	63.9	57.6	40.6	0.0	0.0	63.9

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
4	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	4479	0	0	45,605
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	88	90	101	103	82	51	0	0	514
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.3
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 1029 CHW Equipment														
5	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	17985	20283	22759	23700	19340	11061	0	0	115,128
	PK	0.0	0.0	0.0	0.0	62.2	62.7	65.8	68.1	64.7	49.6	0.0	0.0	68.1
5	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5550	5371	5550	5550	5371	2643	0	0	30,036
	PK	0.0	0.0	0.0	0.0	7.5	7.5	7.5	7.5	7.5	7.5	0.0	0.0	7.5
5	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	103	117	131	136	108	66	0	0	660
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
5	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	93	90	93	93	90	93	90	93	1,095
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 1000 LPS Equipment														
3		STEAM BOILER												
	GAS	4453	4022	4424	4263	0	0	0	0	0	0	4291	4454	25,906
	PK	6.3	6.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.3
3	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 1001 LPS Equipment														
4		STEAM BOILER												
	GAS	301	254	133	129	0	0	0	0	0	0	129	279	1,225
	PK	2.2	2.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2	2.4
4	EQ5311	BOILER CONTROLS												
	ELEC	52	47	47	45	0	0	0	0	0	0	45	53	288
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Bldg. 1029 HW Equipment														
5		WATERTUBE BOILER												
	GAS	336	299	124	120	0	0	0	0	0	0	120	302	1,301
	PK	3.2	3.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.3	3.4
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	669	592	546	528	0	0	0	0	0	0	528	658	3,520
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
5	EQ5311	BOILER CONTROLS												
	ELEC	38	34	31	30	0	0	0	0	0	0	30	37	200
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



```
*****
*****
**                                     **
**          T R A C E    6 0 0    A N A L Y S I S          **
**                                     **
**          by  HUITT & ZOLLARS                               **
**                                     **
*****
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FORT SAM HOUSTON, TEXAS  
CORPS OF ENGINEERS - FORT WORTH, TEXAS  
HUITT-ZOLLARS, INC.  
AREA 1000-BLDGS 1000, 1001, 1029, 1088

Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 13:51: 1 2/24/96  
Dataset Name: FSH1000 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
ECO G-INSTALL EMS AIRSIDE SYSTEMS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	46.8	31	2,677	-561,327	18	1,563	21,913.6	0	0	0.0	0	0
5 - 10	93.6	3	276	-1,122,654	40	3,507	43,827.1	0	0	0.0	0	0
10 - 15	140.4	4	338	-1,683,982	30	2,589	65,740.7	0	0	0.0	0	0
15 - 20	187.2	2	153	-2,245,309	12	1,024	87,654.3	0	0	0.0	0	0
20 - 25	234.1	1	122	-2,806,636	1	57	109,567.8	0	0	0.0	0	0
25 - 30	280.9	0	30	-3,367,963	0	20	131,481.5	0	0	0.0	0	0
30 - 35	327.7	0	0	-3,929,291	0	0	153,395.0	0	0	0.0	0	0
35 - 40	374.5	1	104	-4,490,618	0	0	175,308.6	0	0	0.0	0	0
40 - 45	421.3	6	495	-5,051,946	0	0	197,222.2	0	0	0.0	0	0
45 - 50	468.1	3	304	-5,613,273	0	0	219,135.7	0	0	0.0	0	0
50 - 55	514.9	8	696	-6,174,600	0	0	241,049.3	0	0	0.0	0	0
55 - 60	561.7	4	348	-6,735,927	0	0	262,962.9	0	0	0.0	0	0
60 - 65	608.6	7	609	-7,297,254	0	0	284,876.4	0	0	0.0	0	0
65 - 70	655.4	8	693	-7,858,582	0	0	306,790.1	0	0	0.0	0	0
70 - 75	702.2	8	719	-8,419,909	0	0	328,703.6	66	5,762	0.0	0	0
75 - 80	749.0	5	441	-8,981,236	0	0	350,617.2	0	12	0.0	0	0
80 - 85	795.8	5	438	-9,542,563	0	0	372,530.8	0	29	0.0	0	0
85 - 90	842.6	3	225	-10,103,891	0	0	394,444.3	0	30	0.0	0	0
90 - 95	889.4	1	92	-10,665,218	0	0	416,357.9	0	16	0.0	0	0
95 - 100	936.2	0	0	-11,226,546	0	0	438,271.5	33	2,911	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO G-INSTALL EMS WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	260391	235223	262320	251681	261356	253609	259427	262320	251681	261356	251681	259427	3,070,472
	PK	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	18972	17136	18972	18360	18972	18360	18972	18972	18360	18972	18360	18972	223,380
	PK	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
2		BASE UTILITY												
	CHILLD	7886	7123	7886	7632	7886	7632	7886	7886	7632	7886	7632	7886	92,856
	PK	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
3		BASE UTILITY												
	CHILLD	149	134	149	144	149	144	149	149	144	149	144	149	1,752
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
4		BASE UTILITY												
	CHILLD	0	0	0	0	3348	3240	3348	3348	3240	3348	0	0	19,872
	PK	0.0	0.0	0.0	0.0	4.5	4.5	4.5	4.5	4.5	4.5	0.0	0.0	4.5

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## ----- EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Bldg. 1000 CHW Equipment (CHLR-2)												
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	30725	63733	123019	133551	150870	157613	135814	48549	31059	0	874,932
	PK	0.0	0.0	115.2	158.0	199.6	230.7	243.3	255.4	224.3	141.6	122.4	0.0	255.4
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	5189	8370	13838	13392	13838	13838	13392	7235	5022	0	94,116
	PK	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	218	425	784	825	910	937	835	334	218	0	5,486
	PK	0.0	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.3	0.9	0.8	0.0	1.4
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	10407	16785	27751	26856	27751	27751	26856	14510	10071	0	188,738
	PK	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	8314	13410	22171	21456	22171	22171	21456	11592	8046	0	150,788
	PK	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	279	450	744	720	744	744	720	389	270	0	5,060
	PK	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
		Bldg. 1001 Window Units												
3	EQ1307	PACKAGED TERMINAL AIR CONDITIONER												
	ELEC	160	144	160	156	1559	1675	1812	1915	1486	587	155	160	9,968
	PK	6.4	6.4	6.4	6.7	7.2	7.5	7.7	7.7	7.2	6.7	6.4	6.4	7.7
3	EQ5215	CONDENSER FANS-HEAT PUMP												
	ELEC	11	9	15	18	202	225	295	262	201	75	14	11	1,338
	PK	0.0	0.0	0.0	0.0	0.8	0.8	1.0	1.0	0.8	0.6	0.0	0.0	1.0
3	EQ5308	CONTROLS												
	ELEC	74	67	74	72	74	72	74	74	72	74	72	74	876
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Bldg. 1001 CHW Equipment												
4	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	20905	21885	23480	24825	20544	6719	0	0	118,358
	PK	0.0	0.0	0.0	0.0	63.7	63.1	64.6	65.5	63.3	40.5	0.0	0.0	65.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO G-INSTALL EMS WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
4	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	3765	0	0	44,891
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	86	90	95	101	82	27	0	0	482
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.3
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	4010	0	0	45,136
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	4010	0	0	45,136
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	358	0	0	4,030
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 1029 CHW Equipment														
5	EQ1008S	3-STG CENTRIFUGAL < 300 TONS												
	ELEC	0	0	0	0	16880	17902	19329	21187	16948	7340	0	0	99,585
	PK	0.0	0.0	0.0	0.0	65.9	67.0	69.1	70.1	67.9	47.3	0.0	0.0	70.1
5	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	5550	5371	5550	5550	5371	5550	0	0	32,943
	PK	0.0	0.0	0.0	0.0	7.5	7.5	7.5	7.5	7.5	7.5	0.0	0.0	7.5
5	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	109	115	121	133	106	44	0	0	628
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.5	0.4	0.4	0.0	0.0	0.5
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
5	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	13838	13392	13838	13838	13392	13838	0	0	82,138
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Bldg. 1000 Airside Fans														
1	TYPFAN	GENERIC FAN												
	ELEC	14954	13507	14954	14472	14954	14472	14954	14954	14472	14954	14472	14954	176,076
	PK	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
2	TYPFAN	GENERIC FAN												
	ELEC	9672	8736	9672	9360	9672	9360	9672	9672	9360	9672	9360	9672	113,880
	PK	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
3	TYPFAN	GENERIC FAN												
	ELEC	15252	13776	15252	14760	15252	14760	15252	15252	14760	15252	14760	15252	179,580
	PK	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
4	TYPFAN	GENERIC FAN												
	ELEC	22171	20026	22171	21456	22171	21456	22171	22171	21456	22171	21456	22171	261,048
	PK	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
5	TYPFAN	GENERIC FAN												
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
6	TYPFAN	GENERIC FAN												
	ELEC	1637	1478	1637	1584	1637	1584	1637	1637	1584	1637	1584	1637	19,272
	PK	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Bldg. 1001 Airside Fans														
7	TYPFAN	GENERIC FAN												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
8	TYPFAN	GENERIC FAN												
	ELEC	3893	3502	4358	4325	4234	4275	4338	4711	3965	4030	4053	3782	49,457
	PK	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Bldg. 1029 Airside Fans														
9	TYPFAN	GENERIC FAN												
	ELEC	3967	3583	4628	4403	4334	4276	4411	4793	4059	4226	4386	3867	50,933
	PK	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
Bldg. 1000 HW Equipment														
1	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
	GAS	12407	11610	9573	7345	8523	6909	6024	6070	7259	10763	9223	12384	108,090
	PK	22.2	22.8	18.3	15.5	16.7	14.8	13.5	13.6	15.4	20.9	18.3	22.1	22.8
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	13838	12499	13838	13392	13838	13392	13838	13838	13392	13838	13392	13838	162,936
	PK	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO G-INSTALL EMS WATERSIDE SYSTEMS

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	93	90	93	93	90	93	90	93	1,095
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3		Bldg. 1000 LPS Equipment												
	GAS	4453	4022	4424	4263	0	0	0	0	0	0	4291	4454	25,906
	PK	6.3	6.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.3
3	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
4		Bldg. 1001 LPS Equipment												
	GAS	376	326	133	129	0	0	0	0	0	0	137	385	1,486
	PK	6.6	6.6	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.9	6.6	6.6
4	EQ5311	BOILER CONTROLS												
	ELEC	49	45	47	45	0	0	0	0	0	0	45	50	281
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
5		Bldg. 1029 HW Equipment												
	GAS	545	487	138	120	0	0	0	0	0	0	138	554	1,983
	PK	11.5	11.5	2.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	3.6	11.5	11.5
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	607	546	554	528	0	0	0	0	0	0	537	607	3,379
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
5	EQ5311	BOILER CONTROLS												
	ELEC	35	31	32	30	0	0	0	0	0	0	30	35	192
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO H1 - WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO H1 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	183	120	301	469	496	480	484	498	491	417	303	201	4,441
	PK	0.7	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.7	0.8	0.9
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	11086	10013	11086	10728	11086	10728	11086	11086	10728	11086	10728	11086	130,524
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	44058	99951	131539	129643	132048	137385	133483	73816	48831	0	930,753
	PK	0.0	0.0	155.3	214.3	230.7	229.5	233.2	242.9	240.1	226.7	165.3	0.0	242.9
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	5641	10512	13838	13392	13838	13838	13392	7496	6092	0	98,040
	PK	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	298	637	819	792	799	822	811	478	328	0	5,784
	PK	0.0	0.0	1.0	1.3	1.4	1.4	1.3	1.4	1.4	1.4	1.1	0.0	1.4
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	11563	21261	27751	26856	27751	27751	26856	15032	12309	0	197,130
	PK	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	9238	16986	22171	21456	22171	22171	21456	12009	9834	0	157,493
	PK	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	310	570	744	720	744	744	720	403	330	0	5,285
	PK	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	84940	110638	145249	151120	106423	6520	0	0	604,890
	PK	0.0	0.0	0.0	0.0	214.7	228.3	256.6	267.2	238.0	161.1	0.0	0.0	267.2

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3

## ECO H1 - WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8891	11011	13838	13838	10416	818	0	0	58,813
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	486	625	811	834	598	40	0	0	3,393
	PK	0.0	0.0	0.0	0.0	1.2	1.3	1.4	1.4	1.3	1.0	0.0	0.0	1.4
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	17829	22082	27751	27751	20888	1641	0	0	117,943
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	14244	17642	22171	22171	16688	1311	0	0	94,228
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	478	592	744	744	560	44	0	0	3,162
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4

## ECO H2 - WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	260391	235223	262320	251681	261356	253609	259427	262320	251681	261356	251681	259427	3,070,472
	PK	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2	443.2
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	35786	34632	35786	35786	34632	35786	0	0	212,410
	PK	0.0	0.0	0.0	0.0	48.1	48.1	48.1	48.1	48.1	48.1	0.0	0.0	48.1
2		BASE UTILITY												
	CHILLD	30504	27552	30504	29520	0	0	0	0	0	0	29520	30504	178,104
	PK	41.0	41.0	41.0	41.0	0.0	0.0	0.0	0.0	0.0	0.0	41.0	41.0	41.0
1	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	26119	17409	43074	67742	71287	68749	67481	69770	70879	61365	42890	28742	635,507
	PK	102.9	53.7	139.4	120.3	135.0	134.5	121.0	126.9	141.0	140.7	111.7	120.9	141.0
1	EQ5100	COOLING TOWER FANS												
	ELEC	1044	137	1644	2697	3315	3803	4490	5085	4112	2489	1562	1185	31,563
	PK	8.0	3.9	8.6	6.5	6.8	8.1	9.8	10.5	8.7	7.9	7.1	8.3	10.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO H2 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	182	119	304	473	497	480	481	494	491	422	305	201	4,449
	PK	0.7	0.4	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.9
1	EQ5001	CHILLED WATER PUMP -    CONSTANT VOLUME												
	ELEC	11086	10013	11086	10728	11086	10728	11086	11086	10728	11086	10728	11086	130,524
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	44058	99951	131539	129643	132048	137385	133483	73816	48831	0	930,753
	PK	0.0	0.0	155.3	214.3	230.7	229.5	233.2	242.9	240.1	226.7	165.3	0.0	242.9
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	5641	10512	13838	13392	13838	13838	13392	7496	6092	0	98,040
	PK	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	298	637	819	792	799	822	811	478	328	0	5,784
	PK	0.0	0.0	1.0	1.3	1.4	1.4	1.3	1.4	1.4	1.4	1.1	0.0	1.4
2	EQ5001	CHILLED WATER PUMP -    CONSTANT VOLUME												
	ELEC	0	0	11563	21261	27751	26856	27751	27751	26856	15032	12309	0	197,130
	PK	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	9238	16986	22171	21456	22171	22171	21456	12009	9834	0	157,493
	PK	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	310	570	744	720	744	744	720	403	330	0	5,285
	PK	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	84940	110638	145249	151120	106423	6520	0	0	604,890
	PK	0.0	0.0	0.0	0.0	214.7	228.3	256.6	267.2	238.0	161.1	0.0	0.0	267.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO H2 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8891	11011	13838	13838	10416	818	0	0	58,813
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	486	625	811	834	598	40	0	0	3,393
	PK	0.0	0.0	0.0	0.0	1.2	1.3	1.4	1.4	1.3	1.0	0.0	0.0	1.4
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	17829	22082	27751	27751	20888	1641	0	0	117,943
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	14244	17642	22171	22171	16688	1311	0	0	94,228
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	478	592	744	744	560	44	0	0	3,162
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
ECO H3 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	183	122	301	470	495	479	482	497	490	418	303	202	4,443
	PK	0.7	0.4	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.9
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	11086	10013	11086	10728	11086	10728	11086	11086	10728	11086	10728	11086	130,524
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	8333	7526	8333	8064	8333	8064	8333	8333	8064	8333	8064	8333	98,112
	PK	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	44058	99951	131539	129643	132048	137385	133483	73816	48831	0	930,753
	PK	0.0	0.0	155.3	214.3	230.7	229.5	233.2	242.9	240.1	226.7	165.3	0.0	242.9
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	5641	10512	13838	13392	13838	13838	13392	7496	6092	0	98,040
	PK	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	298	637	819	792	799	822	811	478	328	0	5,784
	PK	0.0	0.0	1.0	1.3	1.4	1.4	1.3	1.4	1.4	1.4	1.1	0.0	1.4
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	11563	21261	27751	26856	27751	27751	26856	15032	12309	0	197,130
	PK	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0.0	37.3
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	9238	16986	22171	21456	22171	22171	21456	12009	9834	0	157,493
	PK	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	310	570	744	720	744	744	720	403	330	0	5,285
	PK	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	84940	110638	145249	151120	106423	6520	0	0	604,890
	PK	0.0	0.0	0.0	0.0	214.7	228.3	256.6	267.2	238.0	161.1	0.0	0.0	267.2



## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1

## ECO H3 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	8891	11011	13838	13838	10416	818	0	0	58,813
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	486	625	811	834	598	40	0	0	3,393
	PK	0.0	0.0	0.0	0.0	1.2	1.3	1.4	1.4	1.3	1.0	0.0	0.0	1.4
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	17829	22082	27751	27751	20888	1641	0	0	117,943
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	14244	17642	22171	22171	16688	1311	0	0	94,228
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	478	592	744	744	560	44	0	0	3,162
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO H4 - WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO H4 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	241	163	749	910	1077	1138	1258	1309	1142	768	792	262	9,810
	PK	0.9	0.5	2.1	2.4	2.0	2.1	2.3	2.4	2.2	2.4	2.2	1.0	2.4
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	22171	20026	22171	21456	22171	21456	22171	22171	21456	22171	21456	22171	261,048
	PK	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	16666	15053	16666	16128	16666	16128	16666	16666	16128	16666	16128	16666	196,224
	PK	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1		HEATER FOR ENGINE DRIVEN CHILLER												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2		ENGINE DRIVEN CHILLER, 80 TONS												
	GAS	0	0	0	4253	11400	12388	14096	14957	12532	3129	0	0	72,753
	PK	0.0	0.0	0.0	12.7	23.5	25.3	29.2	30.8	26.7	15.3	0.0	0.0	30.8
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	6696	13838	13392	13838	13838	13392	4929	0	0	79,924
	PK	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	421	1077	1138	1258	1309	1142	315	0	0	6,660
	PK	0.0	0.0	0.0	1.2	2.0	2.1	2.3	2.4	2.2	1.5	0.0	0.0	2.4
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	10728	22171	21456	22171	22171	21456	7897	0	0	128,051
	PK	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	8064	16666	16128	16666	16666	16128	5936	0	0	96,253
	PK	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	360	744	720	744	744	720	265	0	0	4,297
	PK	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO H4 - WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2		HEATER FOR ENGINE DRIVEN CHILLER												
	ELEC	112	101	112	54	0	0	0	0	0	72	108	112	669
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO I - RETROFIT BOILER PLANT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	93	90	93	93	90	93	90	93	1,095
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1491	1347	1491	1443	0	0	0	0	0	0	1443	1491	8,706
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
2		WATERTUBE BOILER WITH FULL MODULATION												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3		WATERTUBE BOILER WITH FULL MODULATION												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4		STEAM BOILER												
	GAS	3896	3519	3868	3724	0	0	0	0	0	0	3752	3897	22,656
	PK	5.5	5.2	5.2	5.2	0.0	0.0	0.0	0.0	0.0	0.0	5.2	5.2	5.5
4	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## 01 Card - Job Information

-----

Project: 03-0185.06 EEAP BOILER-CHILLER STUDY  
 Location: FT. SAM HOUSTON - SAN ANTONIO, TX.  
 Client: CORPS OF ENGINEERS - FT. WORTH, TEXAS  
 Program User: HUITT - ZOLLARS INC.  
 Comments: AREA 1300

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## Card 11----- Energy Simulation Parameters -----

1st Month	Last Month	Level		Building
Energy	Energy	Of	Holiday	Calendar
Simulation	Simulation	Calculation	Code	Code
				Area
			ARMY1996	

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	AREA 1300 EXISTING BUILDINGS

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	5	ADMIN 1350	179	180	3	3	2.54	12.5			
10	10	DINING 1350	107	108	3	3	2.54	12.5			
15	15	KITCHEN 1350	69	69	3	3	2.54	12.5			
20	20	BARR 1350	398	399	3	3	2.54	12.5			
25	25	ADMIN 1374	100	100	3	4	2.54	13			
30	30	BARR 1374	240	240	3	4	2.54	13			
35	35	ADMIN 1375	100	100	3	4	2.54	13			
40	40	BARR 1375	240	240	3	4	2.54	13			
45	45	ADMIN 1379	100	100	3	4	2.54	13			

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
50	50	BARR 1379	240	240	3	4	2.54	13			
55	55	ADMIN 1380	100	100	3	4	2.54	13			
60	60	BARR 1380	240	240	3	4	2.54	13			
65	65	BLDG. 1385	82	62	3	3.5	2.54	12			
70	70	ADMIN 1382	60	60	3	4	2.54	12			
75	75	BARR 1382	161	161	3	2	2.54	10.5			
80	80	KITCH 1377	100	100	3	3	2.54	12			
85	85	DIN 1377	116	116	3	3	2.54	12			
90	90	BARR 1384	366	366	8	1.5		10			
95	95	LOUNGE 1384	57	57.5	8	1.5		10			
100	100	BLDG 1387	121.5	122	3	5.5	2.54	15.5			
105	105	BLDG 1396	100.5	101	8	5		25			
110	110	CHAPEL 1398	67.5	67.5	8	3		24			
115	115	OFFICE 1398	51	51	8	1	2.54	10			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
5	78	50	78		70	70		ROOM		YES
10	78	50	78		70	70		ROOM		NO
15	78	50	78		70	70		ROOM		NO
20	78	50	78		70	70		ROOM		NO
25	78	50	78		70	70		ROOM		NO
30	78	50	78		70	70		ROOM		NO
35	78	50	78		70	70		ROOM		NO
40	78	50	78		70	70		ROOM		NO
45	78	50	78		70	70		ROOM		NO
50	78	50	78		70	70		ROOM		NO
55	78	50	78		70	70		ROOM		NO
60	78	50	78		70	70		ROOM		NO
65	78	50	78		70	70		ROOM		NO
70	78	50	78		70	70		ROOM		NO
75	78	50	78		70	70		ROOM		NO
80	78	50	78		70	70		ROOM		NO
85	78	50	78		70	70		ROOM		NO
90	78	50	78		70	70				
95	78	50	78		70	70				
100	78	50	78		70	70				
105	78	50	78		70	70				
110	78	50	78		70	70				
115	78	50	78		70	70				



## Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	NO	164	163	0.05	21			
10	1	YES			0.05	21			
15	1	YES			0.05	21			
20	1	NO	282	282	0.05	21			
25	1	NO	88	30	0.07	43			
30	1	NO	164	164	0.07	43			
35	1	NO	88	30	0.07	43			
40	1	NO	164	164	0.07	43			
45	1	NO	88	30	.07	43			
50	1	NO	164	164	0.07	43			
55	1	NO	83	30	0.07	43			
60	1	NO	164	164	0.07	43			
65	1	YES			0.08	47			
70	1	YES			0.07	37			
75	1	NO	114	114	0.07	37			
80	1	YES			0.11	47			
85	1	YES			0.11	47			
90	1	NO	170	170	0.06	28			
100	1	YES			0.11	47			
105	1	NO	155	61.5	0.23	47			
110	1	YES			0.09	37			
115	1	YES			0.1	37			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
5	1	128	12.5	.15	29	0			
20	1	1130	12.5	.15	29	0			
20	2	1400	12.5	.15	29	90			
20	3	1130	12.5	.15	29	180			
20	4	1400	12.5	.15	29	270			
25	1	88	13	.15	94	180			
25	2	40	13	.20	61	270			
25	3	40	13	.20	61	90			
30	1	912	13	.13	80	180			
30	2	768	13	.13	80	270			
30	3	912	13	.13	80	0			
30	4	768	13	.13	80	90			
35	1	88	13	.15	94	180			
35	2	40	13	.20	61	270			
35	3	40	13	.20	61	90			
40	1	912	13	.13	80	180			
40	2	768	13	.13	80	270			
40	3	912	13	.13	80	0			
40	4	768	13	.13	80	90			
45	1	88	13	.15	94	0			
45	2	40	13	.20	61	90			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc Type	Reflectance
					Direction	Multiplier
45	3	40	13	.20	61	270
50	1	912	13	.13	80	0
50	2	768	13	.13	80	90
50	3	912	13	.13	80	180
50	4	768	13	.13	80	270
55	1	88	13	.15	94	0
55	2	40	13	.20	61	90
55	3	40	13	.20	61	270
60	1	912	13	.13	80	0
60	2	768	13	.13	80	90
60	3	912	13	.13	80	180
60	4	768	13	.13	80	270
65	1	82	12	.22	58	0
65	2	62	12	.22	58	90
65	3	82	12	.22	58	180
65	4	62	12	.22	58	270
70	1	44	12	.22	58	0
70	2	52	12	.22	58	90
70	3	68	12	.22	58	270
75	1	360	10.5	.22	58	0
75	2	312	10.5	.22	58	90
75	3	412	10.5	.22	58	180
75	4	312	10.5	.22	58	270
80	1	62	12	.10	58	90
80	2	32	12	.10	58	270
85	1	82	12	.10	58	0
85	2	160	12	.10	58	90
85	3	82	12	.10	58	180
85	4	124	12	.10	58	270
90	1	213	53	0.20	58	0
90	2	210.5	53	0.20	58	90
90	3	167.5	53	0.20	58	180
90	4	243	53	0.20	58	150
90	5	180	53	0.20	58	270
90	6	227	53	0.20	58	330
90	7	45.5	53	0.20	58	240
95	1	72	10.6	0.20	58	0
95	2	72	10.6	0.20	58	180
100	1	122	15	0.1	54	0
100	2	121	14	0.1	54	90
100	3	122	15	0.1	54	180
100	4	121	14	0.1	54	270
105	1	155	20	.21	54	0
105	2	61.5	20	.21	54	90
105	3	155	20	.21	54	180
105	4	61.5	18	.21	54	270
110	1	101	21	.22	58	0

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
110	2	46	22	.22	58	90			
110	3	101	21	.22	58	180			
110	4	46	22	.22	58	270			
115	1	37	12	.22	58	0			
115	2	71	12	.22	58	90			
115	3	71	12	.22	58	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
									Solar to Ret. Air	Visible Transmittance	
5	1	4	5.5	12	.73	1					
20	1	4	5.5	272	.73	1	3				
20	2	4	5.5	84	.73	1	3				
20	3	4	5.5	272	.73	1	3				
20	4	4	5.5	84	.73	1	3				
25	1	4	7	16	1.1	.67	4				
30	1	2	4	144	1.1	.67	4				
30	2	2	4	72	1.1	.67	4				
30	3	2	4	116	1.1	.67	4				
30	4	2	4	72	1.1	.67	4				
35	1	4	7	16	1.1	.67	4				
40	1	2	4	144	1.1	.67	4				
40	2	2	4	72	1.1	.67	4				
40	3	2	4	116	1.1	.67	4				
40	4	2	4	72	1.1	.67	4				
45	1	4	7	16	1.1	.67	4				
50	1	2	4	144	1.1	.67	4				
50	2	2	4	72	1.1	.67	4				
50	3	2	4	116	1.1	.67	4				
50	4	2	4	72	1.1	.67	4				
55	1	4	7	16	1.1	.67	4				
60	1	2	4	144	1.1	.67	4				
60	2	2	4	72	1.1	.67	4				
60	3	2	4	116	1.1	.67	4				
60	4	2	4	72	1.1	.67	4				
65	1	4	4	8	1.1	1	5				
65	2	4	4	8	1.1	1	5				
65	3	4	4	6	1.1	1	5				
65	4	4	4	8	1.1	1	5				
70	1	5	3	7	1.1	1					
70	2	5	3	1	1.1	1					
75	1	6	3	23	1.1	1					
75	2	6	3	16	1.1	1					
75	3	6	3	24	1.1	1					

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
75	4	6	3	14	1.1	1					
85	2	5	5	6	1.1	1					
85	4	5	5	6	1.1	1					
90	1	5	2.5	92	1.1	0.67					
90	2	5	2.5	100	1.1	0.67					
90	3	5	2.5	92	1.1	0.67					
90	4	5	2.5	120	1.1	0.67					
90	5	5	2.5	100	1.1	0.67					
90	6	5	2.5	100	1.1	0.67					
95	1	8	2.5	8	1.1	0.67					
95	2	8	2.5	8	1.1	0.67					
100	1	5	2	3	0.8	1					
100	3	5	2	4	0.8	1					
100	4	5	3	10	0.8	1					
105	2	10	5	2	1.1	1					
110	1	4	2	28	1.1	0.67					
110	2	4	2	28	1.1	0.67					
110	3	4	2	56	1.1	0.67					
115	1	4	2	3	1.1	0.67					
115	2	3	2	3	1.1	0.67					
115	3	4	2	3	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHOFFIC	FSHOFFIC								
10	FSHDINP	FSHDINL								
15	FSHKITCH	FSHKITCH								
20	FSHBARRP	FSHBARRL								
25	FSHOFFIC	FSHOFFIC								
30	FSHBARRP	FSHBARRL								
35	FSHOFFIC	FSHOFFIC								
40	FSHBARRP	FSHBARRL								
45	FSHOFFIC	FSHOFFIC								
50	FSHBARRP	FSHBARRP								
55	FSHOFFIC	FSHOFFIC								
60	FSHBARRP	FSHBARRL								
65	FSHOFFIC	FSHOFFIC								
70	FSHOFFIC	FSHOFFIC								
75	FSHBARRP	FSHBARRL								
80	FSHKITCH	FSHKITCH								
85	FSHDINP	FSHDINL								
90	FSHBARRP	FSHBARRL								
95	FSHLGEP	FSHLGEL								
100	FSHGROCP	FSHGROCL								

Card 26----- Schedules -----										
Room	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights			Minimum	Fans	Fan	Fan	Exhaust	Controls
105	FSHTHEAP	FSHTHEAL								
110	FSHCHAPP	FSHCHAPL								
115	FSHOFFIC	FSHOFFIC								

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Percent	--- Daylighting ---			
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	175	SF-PERS	250	200	1.9	WATT-SF	ASHRAE2					
10	300	PEOPLE	275	275	1.4	WATT-SF	ASHRAE2					
15	20	PEOPLE	275	475	1.5	WATT-SF	ASHRAE2					
20	1538	PEOPLE	250	200	1	WATT-SF	ASHRAE2					
25	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
30	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
35	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
40	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
45	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
50	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
55	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
60	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
65	16	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					
70	8	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2					
75	232	PEOPLE	250	200	.65	WATT-SF	ASHRAE2					
80	30	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2					
85	800	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
90	300	PEOPLE	250	200	1	WATT-SF	ASHRAE1					
95	150	PEOPLE	250	200	2.2	WATT-SF	ASHRAE1					
100	150	PEOPLE	250	200	2.0	WATT-SF	ASHRAE1					
105	490	PEOPLE	250	200	1.7	WATT-SF	ASHRAE1					
110	350	PEOPLE	250	200	1.9	WATT-SF	ASHRAE1					
115	5	PEOPLE	250	200	1.7	WATT-SF	ASHRAE1					

Card 28----- Miscellaneous Equipment -----												
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent				
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional	
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path	
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
10	1	DIN. EQPT.	1	WATT-SF	FSHDINL	NONE						
20	1	TV ETC.	1	WATT-SF	FSHBARRL	NONE						
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
30	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE						
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
40	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE						
45	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						

Card 28----- Miscellaneous Equipment -----											
Room	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
50	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE					
55	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
60	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE					
65	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
70	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE					
75	1	PERS APP.	1	WATT-SF	FSHBARRL	NONE					
80	1	KITCHEN	8	WATT-SF	FSHKITCH	NONE					
85	1	DINING	1	WATT-SF	FSHDINL	NONE					
90	1	BARR EQ	2	WATT-SF	FSHBARRL	NONE					
95	1	BARR EQ	1.3	WATT-SF	FSHLGEL	NONE					
100	1	RETAIL EQ	3	WATT-SF	FSHGROCL	NONE					
115	1	OFFICE EQ	1.4	WATT-SF	FSHOFFIC	NONE					

Card 29----- Room Airflows -----									
-----Ventilation-----					-----Infiltration-----				
Room Number	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--
	Value	Units	Value	Units	Value	Units	Value	Units	Value Units
5	3975	CFM	3975	CFM					
10	20	CFM-P	20	CFM-P					
15	3000	CFM	3000	CFM					
20	17385	CFM	17385	CFM					
25	7700	CFM	7700	CFM					
30	12000	CFM	12000	CFM					
35	7700	CFM	7700	CFM					
40	12000	CFM	12000	CFM					
45	7700	CFM	7700	CFM					
50	12000	CFM	12000	CFM					
55	7700	CFM	7700	CFM					
60	12000	CFM	12000	CFM					
65	900	CFM	900	CFM					
70	20	CFM-P	20	CFM-P					
75	20	CFM-P	20	CFM-P					
80	12700	CFM	12700	CFM					
85	12200	CFM	12200	CFM					
90	4050	CFM	4050	CFM					
95	20	CFM-P	20	CFM-P					
100	6972	CFM	6972	CFM					
105	15	CFM-P	15	CFM-P					
110	15	CFM-P	15	CFM-P					
115	20	CFM-P	20	CFM-P					

Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
5	1	264	12.5	.23	103	HRLYOADB			
5	2	264	12.5	.23	103	HRLYOADB			
5	3	680	12.5	.15	103	HRLYOADB			
10	1	220	12.5	.44	107	HRLYOADB			
25	1	244	13	.20	107	HRLYOADB			
30	1	244	13	.20	107	HRLYOADB			
35	1	244	13	.20	107	HRLYOADB			
40	1	244	13	.20	107	HRLYOADB			
45	1	244	13	.20	107	HRLYOADB			
50	1	244	13	.20	107	HRLYOADB			
55	1	244	13	.20	107	HRLYOADB			
60	1	244	13	.20	107	HRLYOADB			
80	1	30	12	.10	107	HRLYOADB			

Card 33----- External Shading -----

-----OVERHANG-----				-----VERTICAL FINS-----					
Shading Type	Glass Height	Above Glass	Projection Out	Glass Width	Projection Left	Left Projection Out	Right Projection Right	Right Projection Out	Adjacent Building Flag
3	5.5	1	2						
4	4	1	5						
5	4	1	3						

----- System Section Alternative #1 -----

Card 39- System Alternative

Number	Description
1	EXISTING AIRSIDE EQUIPMENT

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	VRH						
2	BPMZ						
3	BPMZ						
4	BPMZ						
5	BPMZ						
6	BPMZ						
7	BPMZ						
8	BPMZ						
9	BPMZ						
10	BPMZ						
11	SZ						





## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
6	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
12	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
13	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
14	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

	Elec Consump	Elec Demand	Demand		----	Demand Limit	----
Alternative	Time of Day	Time of Day	Limit			Temperature	
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift	
1				EXISTING WATERSIDE EQUIPMENT			

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1 1									
2	2		2 8									
3	4		9 10									
4	5		11 11									
5	6		12 12									
6	8		13 14									

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num		-----COOLING-----		-----HEAT RECOVERY-----		Seq	Demand
Ref	Code	Of	--Capacity--	-----Energy----	--Capacity--	-----Energy----	Order	Seq
Num	Name	Units	Value Units	Value Units	Value Units	Value Units	Num	Type
1	EQ1001S	1	438 TONS	329 KW				
2	EQ1001S	1	544 TONS	517 KW			1	SER
3	EQ1001S	1	442 TONS	517 KW			2	SER
4	EQ1001S	1	273 TONS	251 KW				

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand	
Ref Code	Of	--Capacity--		----Energy----		--Capacity--		----Energy----		Order	Seq	Limit
Num Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
5 EQ1288L	1	97	TONS	153.3	KW							
6 EQ1170S	1	7.5	TONS	10.0	KW					1	PAR	
7 EQ1172S	1	50	TONS	63.2	KW					2	PAR	
8 EQ1070L	1	43.6	TONS	55.1	KW							

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	29.8	KW	22.4	KW					1	
2	18.7	KW	29.8	KW					2	2
3			29.84	KW					2	
4	11.2	KW	14.9	KW					3	
7									4	
8	3.7	KW							5	

## Card 65----- Heating Load Assignment -----

Load	All Coil	----- Heating Load Assignment -----									
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	1								
2	3	2	8								
3	5	9	10								
4	6	11	11								
5	7	12	12								
6	8	13	14								

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy		Seq	Switch	Demand						
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit				
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILERWT	1	29.8	KW	5317	MBH	7500	MBH	1					
2	BOILERWT	1	0	KW	4336	MBH	5800	MBH	2					
3	BLR2MOD	1	11.2	KW	5912	MBH	8369	MBH	1			1		
4	BLR2MOD	1	11.2	KW	5912	MBH	8369	MBH	2			3		
5	BOILERWT	1	5.6	KW	3636	MBH	5000	MBH						
6	EQ2263	1	0	KW			153.3	KW						
7	BOILERWT	1	0.2	KW	427.1	MBH	602	MBH				4		
8	BOILERWT	1	3.7	KW	381.8	MBH	525	MBH						

## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						
10	TYPFAN						
11	TYPFAN						
12	TYPFAN						
13	TYPFAN						
14	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

	-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	134.2											
2	33.6											
3	33.6											
4	33.6											
5	33.6											
6	2.2											
7	7.5											
8	7.5											
9	70.8											
10	3.7											
12	9.3											
13	1.9											
14	0.4											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP HT LOS	14.8	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE HT LOSS	20.2	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP HT LOS	25.8	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE HT LOSS	225.6	MBH	FTSAMHTG	HOT-LD	3			
5	PIPE-PUMP HT LOS	7.4	TONS	FTSAMCLG	CHILL-LD	4			
6	PIPE HT LOSS	5.8	MBH	FTSAMHTG	HOT-LD	5			
7	PIPE-PUMP HT LOS	1.1	TONS	FTSAMCLG	CHILL-LD	5			

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
8	PIPE HT LOSS	14.8	MBH	FTSAMHTG	HOT-LD	6			
9	PIPE-PUMP HT LOS	0.1	TONS	FTSAMCLG	CHILL-LD	6			
10	PIPE HT LOSS	15.8	MBH	FTSAMHTG	HOT-LD	7			
11	PIPE-PUMP HT LOS	0.8	TONS	FTSAMCLG	CHILL-LD	7			
12	PIPE HT LOSS	12.6	MBH	FTSAMHTG	HOT-LD	8			
13	PIPE-PUMP HT LOS	1.8	TONS	FTSAMCLG	CHILL-LD	8			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	EQ5100			14.92	KW			1	50	7.46	KW
2	EQ5100			52.22	KW			2			
3	EQ5100			14.9	KW	T-WATER	CTOWER	1	50	7.4	KW
4	EQ5200			3.7	KW	T-WATER	CNDFAN	1			
5	EQ5200			5.6	KW	T-WATER	CNDFAN	1			

## Card 75----- Miscellaneous Accessory -----

#1					#2					#3				
Misc Ref	Equip Code	Energy Value	Energy Units	Sched Code	Equip Code	Energy Value	Energy Units	Sched Code	Equip Code	Energy Value	Energy Units	Sched Code		
1	EQ5020	11.2	KW		EQ5240	7.5	KW							
2	EQ5001	18.7	KW											
3	EQ5240	7.5	KW											
4	EQ5020	0.2	KW											

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO J-INSTALL EMS FOR HVAC EQUIPMENT

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	5	ADMIN 1350	179	180	3	3	2.54	12.5			
10	10	DINING 1350	107	108	3	3	2.54	12.5			

Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Number	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
		Descrip					Resistance	Height	Multiplier	Zone	
15	15	KITCHEN 1350	69	69	3	3	2.54	12.5			
20	20	BARR 1350	398	399	3	3	2.54	12.5			
25	25	ADMIN 1374	100	100	3	4	2.54	13			
30	30	BARR 1374	240	240	3	4	2.54	13			
35	35	ADMIN 1375	100	100	3	4	2.54	13			
40	40	BARR 1375	240	240	3	4	2.54	13			
45	45	ADMIN 1379	100	100	3	4	2.54	13			
50	50	BARR 1379	240	240	3	4	2.54	13			
55	55	ADMIN 1380	100	100	3	4	2.54	13			
60	60	BARR 1380	240	240	3	4	2.54	13			
65	65	BLDG. 1385	82	62	3	3.5	2.54	12			
70	70	ADMIN 1382	60	60	3	4	2.54	12			
75	75	BARR 1382	161	161	3	2	2.54	10.5			
80	80	KITCH 1377	100	100	3	3	2.54	12			
85	85	DIN 1377	116	116	3	3	2.54	12			
90	90	BARR 1384	366	366	8	1.5		10			
95	95	LOUNGE 1384	57	57.5	8	1.5		10			
100	100	BLDG 1387	121.5	122	3	5.5	2.54	15.5			
105	105	BLDG 1396	100.5	101	8	5		25			
110	110	CHAPEL 1398	67.5	67.5	8	3		24			
115	115	OFFICE 1398	51	51	8	1	2.54	10			

Card 21----- Thermostat Parameters -----											
Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
5	78	50	78		70	70		ROOM		YES	
10	78	50	78		70	70		ROOM		NO	
15	78	50	78		70	70		ROOM		NO	
20	78	50	78		70	70		ROOM		NO	
25	78	50	78		70	70		ROOM		NO	
30	78	50	78		70	70		ROOM		NO	
35	78	50	78		70	70		ROOM		NO	
40	78	50	78		70	70		ROOM		NO	
45	78	50	78		70	70		ROOM		NO	
50	78	50	78		70	70		ROOM		NO	
55	78	50	78		70	70		ROOM		NO	
60	78	50	78		70	70		ROOM		NO	
65	78	50	78		70	70		ROOM		NO	
70	78	50	78		70	70		ROOM		NO	
75	78	50	78		70	70		ROOM		NO	
80	78	50	78		70	70		ROOM		NO	
85	78	50	78		70	70		ROOM		NO	
90	78	50	78		70	70					
95	78	50	78		70	70					

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
100	78	50	78		70	70					
105	78	50	78		70	70					
110	78	50	78		70	70					
115	78	50	78		70	70					

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	164	163	0.05	21			
10	1	YES			0.05	21			
15	1	YES			0.05	21			
20	1	NO	282	282	0.05	21			
25	1	NO	88	30	0.07	43			
30	1	NO	164	164	0.07	43			
35	1	NO	88	30	0.07	43			
40	1	NO	164	164	0.07	43			
45	1	NO	88	30	.07	43			
50	1	NO	164	164	0.07	43			
55	1	NO	83	30	0.07	43			
60	1	NO	164	164	0.07	43			
65	1	YES			0.08	47			
70	1	YES			0.07	37			
75	1	NO	114	114	0.07	37			
80	1	YES			0.11	47			
85	1	YES			0.11	47			
90	1	NO	170	170	0.06	28			
100	1	YES			0.11	47			
105	1	NO	155	61.5	0.23	47			
110	1	YES			0.09	37			
115	1	YES			0.1	37			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	1	128	12.5	.15	29	0				
20	1	1130	12.5	.15	29	0				
20	2	1400	12.5	.15	29	90				
20	3	1130	12.5	.15	29	180				
20	4	1400	12.5	.15	29	270				
25	1	88	13	.15	94	180				
25	2	40	13	.20	61	270				

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
25	3	40	13	.20	61	90			
30	1	912	13	.13	80	180			
30	2	768	13	.13	80	270			
30	3	912	13	.13	80	0			
30	4	768	13	.13	80	90			
35	1	88	13	.15	94	180			
35	2	40	13	.20	61	270			
35	3	40	13	.20	61	90			
40	1	912	13	.13	80	180			
40	2	768	13	.13	80	270			
40	3	912	13	.13	80	0			
40	4	768	13	.13	80	90			
45	1	88	13	.15	94	0			
45	2	40	13	.20	61	90			
45	3	40	13	.20	61	270			
50	1	912	13	.13	80	0			
50	2	768	13	.13	80	90			
50	3	912	13	.13	80	180			
50	4	768	13	.13	80	270			
55	1	88	13	.15	94	0			
55	2	40	13	.20	61	90			
55	3	40	13	.20	61	270			
60	1	912	13	.13	80	0			
60	2	768	13	.13	80	90			
60	3	912	13	.13	80	180			
60	4	768	13	.13	80	270			
65	1	82	12	.22	58	0			
65	2	62	12	.22	58	90			
65	3	82	12	.22	58	180			
65	4	62	12	.22	58	270			
70	1	44	12	.22	58	0			
70	2	52	12	.22	58	90			
70	3	68	12	.22	58	270			
75	1	360	10.5	.22	58	0			
75	2	312	10.5	.22	58	90			
75	3	412	10.5	.22	58	180			
75	4	312	10.5	.22	58	270			
80	1	62	12	.10	58	90			
80	2	32	12	.10	58	270			
85	1	82	12	.10	58	0			
85	2	160	12	.10	58	90			
85	3	82	12	.10	58	180			
85	4	124	12	.10	58	270			
90	1	213	53	0.20	58	0			
90	2	210.5	53	0.20	58	90			
90	3	167.5	53	0.20	58	180			
90	4	243	53	0.20	58	150			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground	
					Constuc	Type				Reflectance	Multiplier
90	5	180	53	0.20	58		270				
90	6	227	53	0.20	58		330				
90	7	45.5	53	0.20	58		240				
95	1	72	10.6	0.20	58		0				
95	2	72	10.6	0.20	58		180				
100	1	122	15	0.1	54		0				
100	2	121	14	0.1	54		90				
100	3	122	15	0.1	54		180				
100	4	121	14	0.1	54		270				
105	1	155	20	.21	54		0				
105	2	61.5	20	.21	54		90				
105	3	155	20	.21	54		180				
105	4	61.5	18	.21	54		270				
110	1	101	21	.22	58		0				
110	2	46	22	.22	58		90				
110	3	101	21	.22	58		180				
110	4	46	22	.22	58		270				
115	1	37	12	.22	58		0				
115	2	71	12	.22	58		90				
115	3	71	12	.22	58		270				

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance	
5	1	4	5.5	12	.73	1					
20	1	4	5.5	272	.73	1	3				
20	2	4	5.5	84	.73	1	3				
20	3	4	5.5	272	.73	1	3				
20	4	4	5.5	84	.73	1	3				
25	1	4	7	16	1.1	.67	4				
30	1	2	4	144	1.1	.67	4				
30	2	2	4	72	1.1	.67	4				
30	3	2	4	116	1.1	.67	4				
30	4	2	4	72	1.1	.67	4				
35	1	4	7	16	1.1	.67	4				
40	1	2	4	144	1.1	.67	4				
40	2	2	4	72	1.1	.67	4				
40	3	2	4	116	1.1	.67	4				
40	4	2	4	72	1.1	.67	4				
45	1	4	7	16	1.1	.67	4				
50	1	2	4	144	1.1	.67	4				
50	2	2	4	72	1.1	.67	4				
50	3	2	4	116	1.1	.67	4				
50	4	2	4	72	1.1	.67	4				



## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of Windows	Glass U-Value	Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
55	1	4	7	16	1.1	.67	4				
60	1	2	4	144	1.1	.67	4				
60	2	2	4	72	1.1	.67	4				
60	3	2	4	116	1.1	.67	4				
60	4	2	4	72	1.1	.67	4				
65	1	4	4	8	1.1	1	5				
65	2	4	4	8	1.1	1	5				
65	3	4	4	6	1.1	1	5				
65	4	4	4	8	1.1	1	5				
70	1	5	3	7	1.1	1					
70	2	5	3	1	1.1	1					
75	1	6	3	23	1.1	1					
75	2	6	3	16	1.1	1					
75	3	6	3	24	1.1	1					
75	4	6	3	14	1.1	1					
85	2	5	5	6	1.1	1					
85	4	5	5	6	1.1	1					
90	1	5	2.5	92	1.1	0.67					
90	2	5	2.5	100	1.1	0.67					
90	3	5	2.5	92	1.1	0.67					
90	4	5	2.5	120	1.1	0.67					
90	5	5	2.5	100	1.1	0.67					
90	6	5	2.5	100	1.1	0.67					
95	1	8	2.5	8	1.1	0.67					
95	2	8	2.5	8	1.1	0.67					
100	1	5	2	3	0.8	1					
100	3	5	2	4	0.8	1					
100	4	5	3	10	0.8	1					
105	2	10	5	2	1.1	1					
110	1	4	2	28	1.1	0.67					
110	2	4	2	28	1.1	0.67					
110	3	4	2	56	1.1	0.67					
115	1	4	2	3	1.1	0.67					
115	2	3	2	3	1.1	0.67					
115	3	4	2	3	1.1	0.67					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHOFFIC	FSHOFFIC				DAYSCHED				
10	FSHDINP	FSHDINL				DNGFANSC				
15	FSHKITCH	FSHKITCH				DNGFANSC				
20	FSHBARRP	FSHBARRL				BARRSCHD				
25	FSHOFFIC	FSHOFFIC				DAYSCHED				
30	FSHBARRP	FSHBARRL				BARRSCHD				

Card 26----- Schedules -----										
Room	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number					Minimum	Fans	Fan	Fan	Exhaust	Controls
35	FSHOFFIC	FSHOFFIC				DAYSCHED				
40	FSHBARRP	FSHBARRL				BARRSCHD				
45	FSHOFFIC	FSHOFFIC				DAYSCHED				
50	FSHBARRP	FSHBARRP				BARRSCHD				
55	FSHOFFIC	FSHOFFIC				DAYSCHED				
60	FSHBARRP	FSHBARRL				BARRSCHD				
65	FSHOFFIC	FSHOFFIC				DAYSCHED				
70	FSHOFFIC	FSHOFFIC				DAYSCHED				
75	FSHBARRP	FSHBARRL				BARRSCHD				
80	FSHKITCH	FSHKITCH				DNGFANSC				
85	FSHDINP	FSHDINL				DNGFANSC				
90	FSHBARRP	FSHBARRL								
95	FSHLGEP	FSHLGEL								
100	FSHGROCP	FSHGROCL				DNGFANSC				
105	FSHTHEAP	FSHTHEAL				THESCHED				
110	FSHCHAPP	FSHCHAPL				CRCHSCHD				
115	FSHOFFIC	FSHOFFIC				DAYSCHED				

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Percent	--- Daylighting ---			
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	175	SF-PERS	250	200	1.9	WATT-SF	ASHRAE2					
10	300	PEOPLE	275	275	1.4	WATT-SF	ASHRAE2					
15	20	PEOPLE	275	475	1.5	WATT-SF	ASHRAE2					
20	1538	PEOPLE	250	200	1	WATT-SF	ASHRAE2					
25	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
30	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
35	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
40	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
45	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
50	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
55	35	SF-PERS	250	200	2.0	WATT-SF	ASHRAE2					
60	420	PEOPLE	250	200	1.5	WATT-SF	SUSINCAN					
65	16	PEOPLE	250	200	2.0	WATT-SF	ASHRAE2					
70	8	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2					
75	232	PEOPLE	250	200	.65	WATT-SF	ASHRAE2					
80	30	PEOPLE	250	200	2.2	WATT-SF	ASHRAE2					
85	800	PEOPLE	250	200	1.0	WATT-SF	ASHRAE2					
90	300	PEOPLE	250	200	1	WATT-SF	ASHRAE1					
95	150	PEOPLE	250	200	2.2	WATT-SF	ASHRAE1					
100	150	PEOPLE	250	200	2.0	WATT-SF	ASHRAE1					
105	490	PEOPLE	250	200	1.7	WATT-SF	ASHRAE1					
110	350	PEOPLE	250	200	1.9	WATT-SF	ASHRAE1					
115	5	PEOPLE	250	200	1.7	WATT-SF	ASHRAE1					

Card 28----- Miscellaneous Equipment -----										
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent		
Number	Equipment	Descrip	Consump	Consume	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant
	Number		Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction
										Optional
										Air Path
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
10	1	DIN. EQPT.	1	WATT-SF	FSHDINL	NONE				
20	1	TV ETC.	1	WATT-SF	FSHBARRL	NONE				
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
30	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE				
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
40	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE				
45	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
50	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE				
55	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
60	1	PERS APP.	.5	WATT-SF	FSHBARRL	NONE				
65	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
70	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE				
75	1	PERS APP.	1	WATT-SF	FSHBARRL	NONE				
80	1	KITCHEN	8	WATT-SF	FSHKITCH	NONE				
85	1	DINING	1	WATT-SF	FSHDINL	NONE				
90	1	BARR EQ	2	WATT-SF	FSHBARRL	NONE				
95	1	BARR EQ	1.3	WATT-SF	FSHLGEL	NONE				
100	1	RETAIL EQ	3	WATT-SF	FSHGROCL	NONE				
115	1	OFFICE EQ	1.4	WATT-SF	FSHOFFIC	NONE				

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	3975	CFM	3975	CFM						
10	20	CFM-P	20	CFM-P						
15	3000	CFM	3000	CFM						
20	17385	CFM	17385	CFM						
25	7700	CFM	7700	CFM						
30	12000	CFM	12000	CFM						
35	7700	CFM	7700	CFM						
40	12000	CFM	12000	CFM						
45	7700	CFM	7700	CFM						
50	12000	CFM	12000	CFM						
55	7700	CFM	7700	CFM						
60	12000	CFM	12000	CFM						
65	900	CFM	900	CFM						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	12700	CFM	12700	CFM						
85	12200	CFM	12200	CFM						
90	4050	CFM	4050	CFM						
95	20	CFM-P	20	CFM-P						
100	6972	CFM	6972	CFM						
105	15	CFM-P	15	CFM-P						

Card 29----- Room Airflows -----

Room Number	Ventilation		Infiltration		Cooling		Heating		Reheat Minimum	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
110	15	CFM-P	15	CFM-P						
115	20	CFM-P	20	CFM-P						

Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
5	1	264	12.5	.23	103	HRLYOADB			
5	2	264	12.5	.23	103	HRLYOADB			
5	3	680	12.5	.15	103	HRLYOADB			
10	1	220	12.5	.44	107	HRLYOADB			
25	1	244	13	.20	107	HRLYOADB			
30	1	244	13	.20	107	HRLYOADB			
35	1	244	13	.20	107	HRLYOADB			
40	1	244	13	.20	107	HRLYOADB			
45	1	244	13	.20	107	HRLYOADB			
50	1	244	13	.20	107	HRLYOADB			
55	1	244	13	.20	107	HRLYOADB			
60	1	244	13	.20	107	HRLYOADB			
80	1	30	12	.10	107	HRLYOADB			

Card 33----- External Shading -----

Shading Type	Glass Height	OVERHANG		VERTICAL FINS						Adjacent Building Flag
		Above Glass	Projection Out	Glass Width	Projection Left	Projection Out	Projection Right	Projection Out		
3	5.5	1	2							
4	4	1	5							
5	4	1	3							

----- System Section Alternative #2 -----

Card 39- System Alternative

Number	Description
1	ECO J - AIRSIDE EQUIPMENT

Card 40----- System Type -----

System Set Number	System Type	OPTIONAL VENTILATION SYSTEM					
		Ventil Deck Location	Cooling SADBvh	Heating SADBvh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	VRH						



## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
3	1.0										
4	1.0										
5	1.0										
6	1.0										
7	1.0										
8	1.0										
9	1.0										
10	1.0										
11	1.0										
12	1.0										
13	1.0										
14	1.0										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --			
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
4	DRY-BULB	65	100										
5	DRY-BULB	65	100										
6	DRY-BULB	65	100										
7	DRY-BULB	65	100										
8	DRY-BULB	65	100										
9	DRY-BULB	65	100										
10	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
5	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
6	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
7	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
12	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
13	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
14	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		

----- Equipment Section Alternative #2 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand			
Number	Time of Day	Time of Day	Limit			
	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				ECO J - WATERSIDE EQUIPMENT		

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1 1									
2	2		2 8									
3	4		9 10									
4	5		11 11									
5	6		12 12									
6	8		13 14									

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num		COOLING				HEAT RECOVERY				Seq	Demand	
Ref	Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1001S	1	438	TONS	329	KW							
2	EQ1001S	1	544	TONS	517	KW					1	SER	
3	EQ1001S	1	442	TONS	517	KW					2	SER	
4	EQ1001S	1	273	TONS	251	KW							
5	EQ1288L	1	97	TONS	153.3	KW							
6	EQ1170S	1	7.5	TONS	10.0	KW					1	PAR	
7	EQ1172S	1	50	TONS	63.2	KW					2	PAR	
8	EQ1070L	1	43.6	TONS	55.1	KW							

## Card 63----- Cooling Pumps and References -----

Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Value	Control	Storage	Tower	Access.
1	29.8	KW	22.4	KW						1	
2	18.7	KW	29.8	KW						2	2
3			29.84	KW						2	
4	11.2	KW	14.9	KW						3	
7										4	
8	3.7	KW								5	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1	10					85	55	
2	10					85	55	
3	10					85	55	
4	10					85	55	

## Card 65----- Heating Load Assignment -----

Load	All Coil	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Assignment	Loads To	Begin	End	Begin	End	Begin	End	Begin	End	Begin
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin
1	1	1	1							
2	3	2	8							
3	5	9	10							
4	6	11	11							
5	7	12	12							
6	8	13	14							

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy	Seq	Switch	Demand
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	Limit
Number	Name	Units	Value	Units	Value	Units	Number
1	BOILERWT	1	29.8	KW	5317	MBH	1
2	BOILERWT	1	0	KW	4336	MBH	2
3	BLR2MOD	1	11.2	KW	5912	MBH	1
4	BLR2MOD	1	11.2	KW	5912	MBH	2
5	BOILERWT	1	5.6	KW	3636	MBH	
6	EQ2263	1	0	KW		153.3	
7	BOILERWT	1	0.2	KW	427.1	MBH	4
8	BOILERWT	1	3.7	KW	381.8	MBH	

## Card 69----- Fan Equipment Parameters -----

System	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Set							



Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	TYPFAN						

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						
10	TYPFAN						
11	TYPFAN						
12	TYPFAN						
13	TYPFAN						
14	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

System Set Number	-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----				
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
	KW	KW	KW	KW	KW	KW	KW					
1	134.2											
2	33.6											
3	33.6											
4	33.6											
5	33.6											
6	2.2											
7	7.5											
8	7.5											
9	70.8											
10	3.7											
12	9.3											
13	1.9											
14	0.4											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	PIPE-PUMP HT LOS	14.8	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE HT LOSS	20.2	MBH	FTSAMHTG	HOT-LD	1			
3	PIPE-PUMP HT LOS	25.8	TONS	FTSAMCLG	CHILL-LD	2			
4	PIPE HT LOSS	225.6	MBH	FTSAMHTG	HOT-LD	3			
5	PIPE-PUMP HT LOS	7.4	TONS	FTSAMCLG	CHILL-LD	4			

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
2	1.0										
3	1.0										
4	1.0										
5	1.0										
6	1.0										
7	1.0										
8	1.0										
9	1.0										
10	1.0										
11	1.0										
12	1.0										
13	1.0										
14	1.0										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
5	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
6	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
7	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
12	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
13	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		
14	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG		

## ----- Equipment Section Alternative #3 -----

## Card 59----- Equipment Description / TOD Schedules -----

	Elec Consump	Elec Demand	Demand		----	Demand Limit	----
Alternative	Time of Day	Time of Day	Limit			Temperature	
Number	Schedule	Schedule	Max KW	Alternative Description		Schedule	Drift
3				ECO K1 - WATERSIDE EQUIPMENT			

## Card 60----- Cooling Load Assignment-----

Load All Coil Cooling

Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1		1	14							

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008L	1	570	TONS	313	KW					1		
2	EQ1008L	1	570	TONS	313	KW					2		
3	EQ1001S	1	438	TONS	334.5	KW					3		

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		-----CONDENSER-----		---HT REC or AUX---		Switch-				
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.	
1	29.8	KW	29.8	KW					2		
2	29.8	KW	29.8	KW					2		
3	29.8	KW	22.4	KW					1		

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand				
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving	
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp	
1	DISTRIBUTION LOS	55.6	TONS	FTSAMCLG	CHILL-LD	1				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd					
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.92	KW			1	50	7.46	KW
2	EQ5100			52.22	KW			2			

## ----- Equipment Section Alternative #4 -----

## Card 59----- Equipment Description / TOD Schedules -----

Elec Consump	Elec Demand	Demand						
Alternative	Time of Day	Time of Day	Limit					
Number	Schedule	Schedule	Max KW	Alternative Description				
4				ECO K2 - WATERSIDE EQUIPMENT				

## Card 60----- Cooling Load Assignment-----

Load All Coil Cooling

Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1		1 14								

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	Value	Units	Value	Units	--Capacity--	Value	Units	Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1009	1	570	TONS	313	KW					1		
2	EQ1009	1	570	TONS	313	KW					2		
3	EQ1001S	1	438	TONS	334.5	KW					3		

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	29.8	KW	29.8	KW					2	
2	29.8	KW	29.8	KW					2	
3	29.8	KW	22.4	KW					1	

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand				
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	55.6	TONS	FTSAMCLG	CHILL-LD	1			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd					
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.92	KW			1	50	7.46	KW
2	EQ5100			52.22	KW			2			



Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--		----Energy----		--Capacity--		----Energy----		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	YSCRW22	1	570	TONS	365	KW					1		
2	YSCRW22	1	570	TONS	365	KW					2		
3	EQ1001S	1	438	TONS	334.5	KW					3		

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---				-----CONDENSER-----		---HT REC or AUX---		Switch-			
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.		
1	29.8	KW	29.8	KW						2		
2	29.8	KW	29.8	KW						2		
3	29.8	KW	22.4	KW						1		

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	55.6	TONS	FTSAMCLG	CHILL-LD	1			

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling		Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of
Ref	Code	Value	Units	Value	Units	Type	Type	Cells
1	EQ5100			14.92	KW			1
2	EQ5100			52.22	KW			2

----- Equipment Section Alternative #3 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand			----- Demand Limit ---
Number	Time of Day	Time of Day	Limit			Temperature
	Schedule	Schedule	Max KW	Alternative Description		Schedule
3				ECO K4 - WATERSIDE EQUIPMENT		Drift

Card 60----- Cooling Load Assignment-----  
 Load All Coil Cooling  
 Asgn Loads To Equipment -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Ref Cool Ref Sizing Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 1 14

Card 62----- Cooling Equipment Parameters -----  

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq Limit
Num Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type Number
1 EDC80TON	1	570	TONS	3762	MBH					1	
2 EDC80TON	1	570	TONS	3762	MBH					2	
3 EQ1001S	1	438	TONS	334.5	KW					3	

Card 63----- Cooling Pumps and References -----  

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	29.8	KW	29.8	KW
2	29.8	KW	29.8	KW
3	29.8	KW	22.4	KW

over Cold Cooling Misc.  
 Control Storage Tower Access.  
 2  
 2  
 1

Card 71----- Base Utility Parameters -----  

Base	Base	Hourly	Hourly	Equip	Demand
Utility	Utility	Demand	Demand	Reference	Limiting
Number	Descrip	Value	Units	Code	Number
1	DISTRIBUTION LOS	55.6	TONS	FTSAMCLG	CHILL-LD 1

Schedule Energy  
 Type Temp Temp

Card 74----- Condenser / Cooling Tower Parameters -----  

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd
Tower	Consump	Consump	Of	Airflow	Energy	Energy
Ref	Value	Units	Type	Cells	Low Spd	Value
1 EQ5100	14.92	KW	1	50	7.46	KW
2 EQ5100	52.22	KW	2			

----- Equipment Section Alternative #4 -----

Card 59----- Equipment Description / TOD Schedules -----  

Elec Consump	Elec Demand	Demand	----- Demand Limit -----
Alternative	Time of Day	Time of Day	Limit
Number	Schedule	Schedule	Max KW
4			ECO L - WATERSIDE EQUIPMENT

Alternative Description  
 Temperature  
 Schedule Drift



## Card 65----- Heating Load Assignment -----

Load            All Coil

Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	14								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc.	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Number	Control	Strg Acc.	Cogen Number
1	BOILHEFT	1	5.6	KW	1830	MBH	2000	MBH	1	
2	BOILHEFT	1	5.6	KW	1830	MBH	2000	MBH	2	
3	BOILHEFT	1	5.6	KW	1830	MBH	2000	MBH	3	
4	BOILHEFT	1	5.6	KW	1830	MBH	2000	MBH	4	

## Card 71----- Base Utility Parameters -----

Base Utility	Base Utility	Hourly Demand	Hourly Demand	Schedule	Energy	Equip Reference	Demand Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	294.8	MBH	FTSAMHTG	HOT-LD	1			

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
BARRSCHD COOLING FAN SCHEDULE CODE FOR BARACKS  
CRCHSCHD COOLING FAN SCHEDULE CODE FOR CHURCH  
DAYSCHE COOLING FAN SCHEDULE CODE  
DNGFANSC COOLING FAN SCHEDULE CODE FOR DINING  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHCHAPL F.S.H. CHAPEL LIGHTING SCHEDULE  
FSHCHAPP F.S.H. CHAPEL PEOPLE SCHEDULE  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSHGROCL F.S.H. GROCERY/RETAIL LIGHT SCHEDULE  
FSHGROCP F.S.H. GROCERY/RETAIL PEOPLE SCHEDULE  
FSHKITCH F.S.H. KITCHEN INTERNAL LOAD SCHEDULE  
FSHLGEL F.S.H. LOUNGE LIGHTING SCHEDULE  
FSHLGEP F.S.H. LOUNGE PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FSHTHEAL F.S.H. THEATRE LIGHTING SCHEDULE  
FSHTHEAP F.S.H. THEATRE PEOPLE SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
THESCHED COOLING FAN SCHEDULE CODE FOR THEATRE

## System:

BPMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
SZ SINGLE ZONE SYSTEM  
VRH VARIABLE VOLUME WITH REHEAT

## Equipment:

## Cooling:

EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS  
EQ1008L 3-STG CENTRIFUGAL > 300 TONS  
EQ1009 3-STG CTV WITH VARIABLE FREQUENCY DRV  
EQ1070L RECIPROCATING > 30 TONS  
EQ1170S AIR-CLD COND COMP <22 TONS  
EQ1172S AIR-CLD COND COMP <55 TONS  
EQ1288L AIR TO AIR HEAT PUMP >11 TONS

## Heating:

BLR2MOD WATERTUBE BOILER WITH HIGH-LOW FIRE  
BOILERWT WATERTUBE BOILER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS  
EQ5200 CONDENSER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP  
EQ5240 BOILER FORCED DRAFT FAN

Schedule Name: AVAIL

Project: AVAILABLE (100)

Location:

Client: VERSION 3.0

Program User: C.D.S. MARKETING

Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: BARRSCHD

Project: COOLING FAN SCHEDULE CODE FOR B

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----

0 100

8 0

17 100

24

Schedule Name: CRCHSCHD

Project: COOLING FAN SCHEDULE CODE FOR C

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
7 100  
16 0  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
6 100  
16 0  
24

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0	0
6	100
17	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
12	100
16	0
24	

Schedule Name: DNGFANSC

Project: COOLING FAN SCHEDULE CODE FOR D

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: SAT

Hour Util Percent

-----

0	0
4	100
21	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0	0
12	100
16	0
24	

Schedule Name: FSHBARRL

Project: F.S.H. BARRACKS LIGHT\MISC. SCH

Location: F.S.H. - SAN ANTONIO TEXAS

Client: CORPS OF ENGRS,PUBLIC WORKS DIRE

Program User: HUITT ZOLLARS, INC.

Comments: LIGHT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 5

17 80

22 5

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 5

8 50

22 5

24



Schedule Name: FSHBARRP  
Project: F.S.H. BARRACKS PEOPLE SCHEDULE  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR BARRACKS

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 100

8 0

17 80

22 100

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 50

24

Schedule Name: FSHCHAPL  
Project: F.S.H. CHAPEL LIGHTING SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 0

19 100

20 0

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----

0 0

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0 0

9 100

12 0

24

Schedule Name: FSHCHAPP  
Project: FSH CHAPEL PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	0
19	15
20	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----

0	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0	0
9	80
12	0
24	

Schedule Name: FSHDINL  
Project: F.S.H. BARRACKS DINING LIGHTING  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----

0 0

5 100

19 0

24

Schedule Name: FSHDINP  
Project: F.S.H. BARRACKS DINING PEOPLE S  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
6 100  
9 0  
11 100  
14 0  
17 100  
19 0  
24

Schedule Name: FSHGROCL  
Project: F.S.H. GROCERY  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----

0 0

11 100

20 0

24

Schedule Name: FSHGROCP  
Project: F.S.H. GROCERY  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
11 10  
17 100  
20 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
11 50  
20 0  
24

Schedule Name: FSHKITCH  
Project: F.S.H. KITCHEN INTERNAL LOAD SC  
Location: F.S.H. - SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR KITCHEN

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
4 100  
21 0  
24



Schedule Name: FSHLGEL  
Project: F.S.H. LOUNGE LIGHTING SCHEDULE  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
19 100  
21 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
19 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHLGEP

Project: F.S.H. LOUNGE PEOPLE SCHEDULE

Location: SAN ANTONIO TEXAS

Client: CORPS OF ENGRS,PUBLIC WORKS DIRE

Program User: HUITT ZOLLARS, INC.

Comments: PEOPLE SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	0
19	15
21	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

Hour	Util Percent
0	0
19	75
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
24	

Schedule Name: FSHOFFIC

Project: F.S.H. OFFICE INTERNAL LOAD SCH

Location: F.S.H. SAN ANTONIO, TEXAS

Client: CORPS OF ENGRS,PUBLIC WORKS DIRE

Program User: HUITT ZOLLARS, INC. - JTC,

Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 0

8 100

12 10

13 100

17 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Schedule Name: FSHTHEAL  
Project: F.S.H. THEATRE LIGHTING SCHEDUL  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
10 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
19 100  
21 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHTHEAP  
Project: F.S.H. THEATRE PEOPLE SCHEDULE  
Location: BEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 25  
10 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
19 75  
21 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: THESCHED

Project: COOLING FAN SCHEDULE CODE FOR T

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	0
6	100
14	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

Hour	Util Percent
0	0
14	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
24	



## Utility Description Reference Table

## Schedules:

FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHCHAPL F.S.H. CHAPEL LIGHTING SCHEDULE  
FSHCHAPP F.S.H. CHAPEL PEOPLE SCHEDULE  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSHGROCL F.S.H. GROCERY/RETAIL LIGHT SCHEDULE  
FSHGROCP F.S.H. GROCERY/RETAIL PEOPLE SCHEDULE  
FSHKITCH F.S.H. KITCHEN INTERNAL LOAD SCHEDULE  
FSHLGEL F.S.H. LOUNGE LIGHTING SCHEDULE  
FSHLGEP F.S.H. LOUNGE PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FSHTHEAL F.S.H. THEATRE LIGHTING SCHEDULE  
FSHTHEAP F.S.H. THEATRE PEOPLE SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY

## System:

BPMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
SZ SINGLE ZONE SYSTEM  
VRH VARIABLE VOLUME WITH REHEAT

## Equipment:

## Cooling:

EDC80TON ENGINE DRIVEN CHILLER, 80 TONS  
EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS  
EQ1070L RECIPROCATING > 30 TONS  
EQ1170S AIR-CLD COND COMP <22 TONS  
EQ1172S AIR-CLD COND COMP <55 TONS  
EQ1288L AIR TO AIR HEAT PUMP >11 TONS  
YSCRW22 YORK W.C. SCREW CHILLER

## Heating:

BLR2MOD WATERTUBE BOILER WITH HIGH-LOW FIRE  
BOILERWT WATERTUBE BOILER  
BOILHEFT HIGH EFFICIENCY MODULAR FIRETUBE BOIL.  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS  
EQ5200 CONDENSER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP  
EQ5240 BOILER FORCED DRAFT FAN

```
*****
*****
**
**          T R A C E    6 0 0    A N A L Y S I S          **
**
**          by  HUITT & ZOLLARS          **
**
*****
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON - SAN ANTONIO, TX.  
CORPS OF ENGINEERS - FT. WORTH, TEXAS  
HUITT - ZOLLARS INC.  
AREA 1300

Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 17:29: 8 2/26/96  
Dataset Name: FSH1300 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	96.4	9	382	-640,919	48	1,262	31,312.7	0	0	0.0	0	0
5 - 10	192.9	5	239	-1,281,837	14	366	62,625.3	0	0	0.0	0	0
10 - 15	289.3	9	418	-1,922,756	8	203	93,938.0	0	0	0.0	0	0
15 - 20	385.8	12	511	-2,563,674	6	153	125,250.7	0	0	0.0	0	0
20 - 25	482.2	11	499	-3,204,593	6	147	156,563.4	0	0	0.0	0	0
25 - 30	578.7	7	302	-3,845,511	7	172	187,876.1	0	0	0.0	0	0
30 - 35	675.1	8	346	-4,486,430	3	87	219,188.7	0	0	0.0	0	0
35 - 40	771.6	6	284	-5,127,349	7	176	250,501.4	0	0	0.0	0	0
40 - 45	868.0	8	367	-5,768,268	3	68	281,814.1	0	0	0.0	0	0
45 - 50	964.5	7	328	-6,409,187	0	0	313,126.8	0	0	0.0	0	0
50 - 55	1,060.9	8	336	-7,050,105	0	0	344,439.4	0	0	0.0	0	0
55 - 60	1,157.4	5	215	-7,691,024	0	0	375,752.2	0	0	0.0	0	0
60 - 65	1,253.8	2	107	-8,331,942	0	0	407,064.9	0	0	0.0	0	0
65 - 70	1,350.3	2	82	-8,972,860	0	0	438,377.5	0	0	0.0	0	0
70 - 75	1,446.7	0	0	-9,613,778	0	0	469,690.2	0	0	0.0	0	0
75 - 80	1,543.2	0	0	-10,254,698	0	0	501,002.8	0	0	0.0	0	0
80 - 85	1,639.6	0	0	-10,895,616	0	0	532,315.6	64	5,582	0.0	0	0
85 - 90	1,736.1	0	0	-11,536,537	0	0	563,628.3	4	342	0.0	0	0
90 - 95	1,832.5	0	0	-12,177,456	0	0	594,940.9	0	15	0.0	0	0
95 - 100	1,929.0	0	0	-12,818,373	0	0	626,253.6	32	2,821	0.0	0	0
Hours Off	0.0	0	4,344	0	0	6,126	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11011	10656	11011	11011	10656	11011	0	0	65,357
	PK	0.0	0.0	0.0	0.0	14.8	14.8	14.8	14.8	14.8	14.8	0.0	0.0	14.8
2		BASE UTILITY												
	HOTLD	150	136	150	145	0	0	0	0	0	0	145	150	877
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
3		BASE UTILITY												
	CHILLD	0	0	0	0	19195	18576	19195	19195	18576	19195	0	0	113,933
	PK	0.0	0.0	0.0	0.0	25.8	25.8	25.8	25.8	25.8	25.8	0.0	0.0	25.8
4		BASE UTILITY												
	HOTLD	1678	1516	1678	1624	0	0	0	0	0	0	1624	1678	9,800
	PK	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	5506	5328	5506	5506	5328	5506	0	0	32,678
	PK	0.0	0.0	0.0	0.0	7.4	7.4	7.4	7.4	7.4	7.4	0.0	0.0	7.4
6		BASE UTILITY												
	HOTLD	43	39	43	42	0	0	0	0	0	0	42	43	252
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7		BASE UTILITY												
	CHILLD	0	0	0	0	818	792	818	818	792	818	0	0	4,858
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
8		BASE UTILITY												
	HOTLD	110	99	110	107	0	0	0	0	0	0	107	110	643
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
9		BASE UTILITY												
	CHILLD	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
10		BASE UTILITY												
	HOTLD	118	106	118	114	0	0	0	0	0	0	114	118	686
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
11		BASE UTILITY												
	CHILLD	0	0	0	0	595	576	595	595	576	595	0	0	3,533
	PK	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.8
12		BASE UTILITY												
	HOTLD	94	85	94	91	0	0	0	0	0	0	91	94	547
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
13		BASE UTILITY												
	CHILLD	0	0	0	0	1339	1296	1339	1339	1296	1339	0	0	7,949
	PK	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0	1.8
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	81732	95090	112236	116974	94822	47411	0	0	548,265
	PK	0.0	0.0	0.0	0.0	315.0	311.6	326.8	330.2	321.9	230.6	0.0	0.0	330.2
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11100	10742	11100	11100	10742	5392	0	0	60,178
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

Bldg. 1350 CHW Equipment

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	444	523	618	641	520	222	0	0	2,967
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.4	0.0	0.0	1.7
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	16666	16128	16666	16666	16128	16666	0	0	98,918
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS Bldgs. 1374, 75, 77, 79, 80 CHW Equipment (CHLR-1)												
	ELEC	0	0	0	0	171540	219562	273740	283231	213234	51054	0	0	1,212,362
	PK	0.0	0.0	0.0	0.0	481.2	496.7	503.9	510.2	495.7	411.0	0.0	0.0	510.2
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	38852	37598	38852	38852	37598	18871	0	0	210,623
	PK	0.0	0.0	0.0	0.0	52.2	52.2	52.2	52.2	52.2	52.2	0.0	0.0	52.2
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	764	1039	1348	1416	972	178	0	0	5,717
	PK	0.0	0.0	0.0	0.0	3.3	3.5	4.1	4.1	3.6	2.0	0.0	0.0	4.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13913	13464	13913	13913	13464	13913	0	0	82,579
	PK	0.0	0.0	0.0	0.0	18.7	18.7	18.7	18.7	18.7	18.7	0.0	0.0	18.7
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13913	13464	13913	13913	13464	13913	0	0	82,579
	PK	0.0	0.0	0.0	0.0	18.7	18.7	18.7	18.7	18.7	18.7	0.0	0.0	18.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ1001S	Bldgs. 1374, 75, 77, 79, 80 CHW Equipment (CHLR-2)												
	2-STG CENTRIFUGAL CHILLER <550 TONS													
	ELEC	0	0	0	0	2505	14109	33779	42279	7253	0	0	0	99,925
	PK	0.0	0.0	0.0	0.0	273.4	344.6	499.0	510.2	378.4	0.0	0.0	0.0	510.2
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	1313	3999	7997	8564	2686	0	0	0	24,558
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	0.0	0.0	0.0	29.8
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	44	134	268	287	90	0	0	0	823
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0
4	EQ1001S	Bldg. 1384 CHW Equipment												
	2-STG CENTRIFUGAL CHILLER <550 TONS													
	ELEC	0	0	0	0	100842	57348	66943	67437	56086	28155	0	0	376,812
	PK	0.0	0.0	0.0	0.0	204.0	195.4	206.9	215.1	194.1	140.9	0.0	0.0	215.1
4	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	4939	0	0	59,652
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
4	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	476	245	293	292	236	121	0	0	1,663
	PK	0.0	0.0	0.0	0.0	0.9	0.9	1.0	1.0	0.9	0.7	0.0	0.0	1.0
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
5	EQ1288L	Bldg. 1387 CHW Equipment												
	AIR TO AIR HEAT PUMP >11 TONS													
	ELEC	27947	26164	31734	31505	21894	27497	34761	35552	25007	10217	30771	30456	333,506
	PK	84.5	87.3	84.4	84.4	96.4	106.6	118.7	123.0	103.2	70.1	84.4	84.4	123.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ5210	CONDENSER FANS-ROOFTOP CHILLER												
	ELEC	0	0	0	0	1553	1894	2810	2456	1793	704	0	0	11,209
	PK	0.0	0.0	0.0	0.0	7.1	7.7	11.8	11.8	7.7	5.0	0.0	0.0	11.8
5	EQ5306	CONTROLS												
	ELEC	34	32	37	36	37	36	37	37	36	37	36	37	434
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6	EQ1170S	Bldg. 1396 CHW Equipment												
	ELEC	0	0	0	0	906	1531	2481	2599	1383	87	0	0	8,987
	PK	0.0	0.0	0.0	0.0	8.4	9.6	10.2	10.1	9.4	7.5	0.0	0.0	10.2
6	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	93	156	298	268	144	7	0	0	966
	PK	0.0	0.0	0.0	0.0	0.9	1.0	1.0	1.0	1.0	0.7	0.0	0.0	1.0
6	EQ5313	CONTROLS												
	ELEC	0	0	0	0	146	169	195	195	162	112	0	0	979
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
7	EQ1172S	AIR-CLD COND COMP <55 TONS												
	ELEC	0	0	0	0	3539	7758	12352	12858	5872	0	0	0	42,379
	PK	0.0	0.0	0.0	0.0	54.3	60.8	64.3	63.8	59.4	32.5	0.0	0.0	64.3
7	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	225	476	898	767	366	0	0	0	2,733
	PK	0.0	0.0	0.0	0.0	3.3	3.6	3.7	3.7	3.6	2.0	0.0	0.0	3.7
7	EQ5313	CONTROLS												
	ELEC	0	0	0	0	62	115	146	146	87	0	0	0	556
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
8	EQ1070L	Bldg. 1398 CHW Equipment												
	ELEC	0	0	0	0	6959	10933	15674	16733	9821	2476	0	0	62,597
	PK	0.0	0.0	0.0	0.0	61.2	66.1	69.9	70.7	68.9	37.4	0.0	0.0	70.7
8	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	579	910	1580	1391	813	207	0	0	5,481
	PK	0.0	0.0	0.0	0.0	5.4	5.6	5.6	5.6	5.6	3.4	0.0	0.0	5.6
8	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7



## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldgs. 1374, 75, 77, 79, 80 HW Equipment (BLR-1)														
3	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
	GAS	14643	15800	2764	2299	0	0	0	0	0	0	2591	15616	53,713
	PK	63.6	61.3	12.7	3.2	0.0	0.0	0.0	0.0	0.0	0.0	9.3	56.8	63.6
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	8333	7526	8333	8064	0	0	0	0	0	0	8064	8333	48,653
	PK	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2	11.2
3	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	8333	7526	8333	8064	0	0	0	0	0	0	8064	8333	48,653
	PK	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2	11.2
3	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	5580	5040	5580	5400	0	0	0	0	0	0	5400	5580	32,580
	PK	7.5	7.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5	7.5
Bldgs. 1374, 75, 77, 79, 80 HW Equipment (BLR-2)														
4	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bldg. 1384 HW Equipment														
5		WATERTUBE BOILER												
	GAS	594	602	145	31	0	0	0	0	0	0	115	597	2,085
	PK	2.2	2.3	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.0	2.3
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	2425	2330	638	168	0	0	0	0	0	0	465	2369	8,394
	PK	5.6	5.6	5.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.6

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING WATERSIDE EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ5311	BOILER CONTROLS												
	ELEC	54	52	14	4	0	0	0	0	0	0	10	53	187
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
6	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	18239	17811	5025	3214	0	0	0	0	0	0	5117	19827	69,232
	PK	87.8	87.3	54.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	49.6	85.4	87.8
		Bldg. 1387 HW Equipment												
7		WATERTUBE BOILER												
	GAS	1783	1764	419	160	0	0	0	0	0	0	436	1802	6,365
	PK	4.7	4.7	3.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.9	4.6	4.7
		Bldg. 1396 HW Equipment												
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	149	134	149	144	0	0	0	0	0	0	144	149	869
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
7	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	149	134	149	144	0	0	0	0	0	0	144	149	869
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
		Bldg. 1398 HW Equipment												
8		WATERTUBE BOILER												
	GAS	1259	1277	280	138	0	0	0	0	0	0	307	1190	4,452
	PK	3.4	3.5	2.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.1	3.5
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	2753	2486	2753	2664	0	0	0	0	0	0	2664	2753	16,073
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
8	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

```
*****
*****
**
**          T R A C E    6 0 0    A N A L Y S I S          **
**
**          by  HUITT & ZOLLARS          **
**
*****
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FT. SAM HOUSTON - SAN ANTONIO, TX.  
CORPS OF ENGINEERS - FT. WORTH, TEXAS  
HUITT - ZOLLARS INC.  
AREA 1300

## Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 19:33:24 2/26/96  
Dataset Name: FSH1300 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
ECO J - AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	96.4	10	435	-676,562	59	1,818	31,312.7	0	0	0.0	0	0
5 - 10	192.9	9	395	-1,353,124	11	329	62,625.3	0	0	0.0	0	0
10 - 15	289.3	4	190	-2,029,687	8	235	93,938.0	0	0	0.0	0	0
15 - 20	385.8	5	226	-2,706,249	7	219	125,250.7	0	0	0.0	0	0
20 - 25	482.2	9	392	-3,382,811	7	218	156,563.4	0	0	0.0	0	0
25 - 30	578.7	12	525	-4,059,374	7	206	187,876.1	4	365	0.0	0	0
30 - 35	675.1	15	635	-4,735,936	2	75	219,188.7	2	196	0.0	0	0
35 - 40	771.6	7	310	-5,412,499	0	0	250,501.4	1	49	0.0	0	0
40 - 45	868.0	6	260	-6,089,061	0	0	281,814.1	6	525	0.0	0	0
45 - 50	964.5	5	227	-6,765,623	0	0	313,126.8	25	2,150	0.0	0	0
50 - 55	1,060.9	2	108	-7,442,185	0	0	344,439.4	0	0	0.0	0	0
55 - 60	1,157.4	1	53	-8,118,748	0	0	375,752.2	0	0	0.0	0	0
60 - 65	1,253.8	3	126	-8,795,310	0	0	407,064.9	27	2,373	0.0	0	0
65 - 70	1,350.3	4	177	-9,471,872	0	0	438,377.5	11	952	0.0	0	0
70 - 75	1,446.7	5	203	-10,148,434	0	0	469,690.2	2	135	0.0	0	0
75 - 80	1,543.2	2	79	-10,824,997	0	0	501,002.8	8	707	0.0	0	0
80 - 85	1,639.6	0	9	-11,501,560	0	0	532,315.6	5	460	0.0	0	0
85 - 90	1,736.1	0	4	-12,178,123	0	0	563,628.3	9	816	0.0	0	0
90 - 95	1,832.5	0	0	-12,854,686	0	0	594,940.9	0	0	0.0	0	0
95 - 100	1,929.0	0	0	-13,531,245	0	0	626,253.6	0	32	0.0	0	0
Hours Off	0.0	0	4,406	0	0	5,660	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO J - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	11011	10656	11011	11011	10656	11011	0	0	65,357
	PK	0.0	0.0	0.0	0.0	14.8	14.8	14.8	14.8	14.8	14.8	0.0	0.0	14.8
2		BASE UTILITY												
	HOTLD	150	136	150	145	0	0	0	0	0	0	145	150	877
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
3		BASE UTILITY												
	CHILLD	0	0	0	0	19195	18576	19195	19195	18576	19195	0	0	113,933
	PK	0.0	0.0	0.0	0.0	25.8	25.8	25.8	25.8	25.8	25.8	0.0	0.0	25.8
4		BASE UTILITY												
	HOTLD	1678	1516	1678	1624	0	0	0	0	0	0	1624	1678	9,800
	PK	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO J - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5		BASE UTILITY												
	CHILLD	0	0	0	0	5506	5328	5506	5506	5328	5506	0	0	32,678
	PK	0.0	0.0	0.0	0.0	7.4	7.4	7.4	7.4	7.4	7.4	0.0	0.0	7.4
6		BASE UTILITY												
	HOTLD	43	39	43	42	0	0	0	0	0	0	42	43	252
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7		BASE UTILITY												
	CHILLD	0	0	0	0	818	792	818	818	792	818	0	0	4,858
	PK	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	1.1
8		BASE UTILITY												
	HOTLD	110	99	110	107	0	0	0	0	0	0	107	110	643
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
9		BASE UTILITY												
	CHILLD	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
10		BASE UTILITY												
	HOTLD	118	106	118	114	0	0	0	0	0	0	114	118	686
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
11		BASE UTILITY												
	CHILLD	0	0	0	0	595	576	595	595	576	595	0	0	3,533
	PK	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.8
12		BASE UTILITY												
	HOTLD	94	85	94	91	0	0	0	0	0	0	91	94	547
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
13		BASE UTILITY												
	CHILLD	0	0	0	0	1339	1296	1339	1339	1296	1339	0	0	7,949
	PK	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0	1.8
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	79760	94247	109874	114646	91599	36936	0	0	527,062
	PK	0.0	0.0	0.0	0.0	311.6	322.2	326.8	330.2	322.4	290.7	0.0	0.0	330.2
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11100	10742	11100	11100	10742	11100	0	0	65,887
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

Bldg. 1350 CHW Equipment



## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO J - WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	432	512	597	623	497	184	0	0	2,846
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	1.7
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	16666	16128	16666	16666	16128	16666	0	0	98,918
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1001S	Bldgs. 1374, 75, 77, 79, 80 CHW Equipment (CHLR-1) 2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	180734	222560	264882	281685	213599	47986	0	0	1,211,446
	PK	0.0	0.0	0.0	0.0	481.2	496.7	503.9	510.2	495.7	425.7	0.0	0.0	510.2
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	38852	37598	38852	38852	37598	38852	0	0	230,604
	PK	0.0	0.0	0.0	0.0	52.2	52.2	52.2	52.2	52.2	52.2	0.0	0.0	52.2
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	913	1192	1427	1530	1108	185	0	0	6,354
	PK	0.0	0.0	0.0	0.0	3.3	3.7	4.1	4.1	3.7	2.1	0.0	0.0	4.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13913	13464	13913	13913	13464	13913	0	0	82,579
	PK	0.0	0.0	0.0	0.0	18.7	18.7	18.7	18.7	18.7	18.7	0.0	0.0	18.7
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	13913	13464	13913	13913	13464	13913	0	0	82,579
	PK	0.0	0.0	0.0	0.0	18.7	18.7	18.7	18.7	18.7	18.7	0.0	0.0	18.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO J - WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Bldgs. 1374, 75, 77, 79, 80 CHW Equipment (CHLR-2)														
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	18542	41369	55317	64138	31786	0	0	0	211,152
	PK	0.0	0.0	0.0	0.0	281.5	391.4	503.9	510.2	394.1	0.0	0.0	0.0	510.2
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	4476	7042	8624	8773	5520	0	0	0	34,435
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	0.0	0.0	0.0	29.8
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	150	236	289	294	185	0	0	0	1,154
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0
Bldg. 1384 CHW Equipment														
4	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	97914	53752	63031	63489	52477	7371	0	0	338,034
	PK	0.0	0.0	0.0	0.0	201.4	192.3	204.1	212.6	190.8	135.2	0.0	0.0	212.6
4	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
4	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	474	242	289	288	233	24	0	0	1,550
	PK	0.0	0.0	0.0	0.0	0.9	0.9	1.0	1.0	0.9	0.7	0.0	0.0	1.0
4	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	8333	8064	8333	8333	8064	8333	0	0	49,459
	PK	0.0	0.0	0.0	0.0	11.2	11.2	11.2	11.2	11.2	11.2	0.0	0.0	11.2
4	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11086	10728	11086	11086	10728	11086	0	0	65,798
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
4	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Bldg. 1387 CHW Equipment														
5	EQ1288L	AIR TO AIR HEAT PUMP >11 TONS												
	ELEC	28280	26444	31734	31505	23161	26603	30682	32711	24926	12365	30771	30504	329,687
	PK	93.8	92.6	84.4	84.4	100.9	107.7	119.7	123.6	104.0	70.1	84.4	88.7	123.6

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

## ECO J - WATERSIDE EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ5210	CONDENSER FANS-ROOFTOP CHILLER												
	ELEC	0	0	0	0	1656	1873	2671	2323	1818	856	0	0	11,196
	PK	0.0	0.0	0.0	0.0	8.3	8.3	11.8	11.8	8.3	5.0	0.0	0.0	11.8
5	EQ5306	CONTROLS												
	ELEC	34	32	37	36	37	36	37	37	36	37	36	37	434
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
6	EQ1170S	Bldg. 1396 CHW Equipment												
	ELEC	0	0	0	0	1008	1266	1489	1687	1265	374	0	0	7,088
	PK	0.0	0.0	0.0	0.0	8.9	9.8	10.1	10.0	9.4	5.2	0.0	0.0	10.1
6	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	99	131	209	180	132	30	0	0	782
	PK	0.0	0.0	0.0	0.0	0.9	1.0	1.0	1.0	1.0	0.6	0.0	0.0	1.0
6	EQ5313	CONTROLS												
	ELEC	0	0	0	0	142	140	143	145	139	129	0	0	839
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
7	EQ1172S	Bldg. 1398 CHW Equipment												
	ELEC	0	0	0	0	5837	7893	9251	10489	7569	1134	0	0	42,172
	PK	0.0	0.0	0.0	0.0	56.9	61.7	64.0	63.5	59.4	34.5	0.0	0.0	64.0
7	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	334	476	577	658	461	48	0	0	2,554
	PK	0.0	0.0	0.0	0.0	3.5	3.7	3.7	3.7	3.6	2.2	0.0	0.0	3.7
7	EQ5313	CONTROLS												
	ELEC	0	0	0	0	58	65	63	67	60	28	0	0	341
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
8	EQ1070L	RECIPROCATING > 30 TONS												
	ELEC	0	0	0	0	10784	12782	15496	17187	13446	4277	0	0	73,971
	PK	0.0	0.0	0.0	0.0	67.0	68.0	69.9	70.7	68.9	41.0	0.0	0.0	70.7
8	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	954	1126	1703	1450	1164	360	0	0	6,757
	PK	0.0	0.0	0.0	0.0	5.6	5.6	5.6	5.6	5.6	3.8	0.0	0.0	5.6
8	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7

## ----- EQUIPMENT ENERGY CONSUMPTION

[illegible]

## ----- EQUIPMENT ENERGY CONSUMPTION

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
10	TYPFAN	GENERIC FAN												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	TYPFAN	Bldg. 1387 Airside Fans												
	ELEC	8178	7486	8652	8106	8415	8342	8178	8652	8106	8415	7632	5574	95,736
	PK	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
12	TYPFAN	Bldg. 1396 Airside Fans												
	ELEC	1934	1786	2083	1953	2009	2009	1953	2083	1953	2009	1767	1097	22,636
	PK	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
13	TYPFAN	Bldg. 1398 Airside Fans												
	ELEC	473	420	469	437	471	452	456	469	437	471	475	511	5,542
	PK	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
14	TYPFAN	GENERIC FAN												
	ELEC	108	98	114	104	111	110	106	114	104	111	104	80	1,264
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1		Bldg. 1350 HW Equipment (BLR-1)												
	GAS	469	184	0	0	0	0	0	0	0	0	0	0	653
	PK	8.8	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1848	834	0	0	0	0	0	0	0	0	0	0	2,682
	PK	29.8	29.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.8
1	EQ5311	BOILER CONTROLS												
	ELEC	8	4	0	0	0	0	0	0	0	0	0	0	11
	PK	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2		Bldg. 1350 HW Equipment (BLR-2)												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO J - WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
3	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
		Bldgs. 1374, 75, 77, 79, 80 HW Equipment (BLR-1)												
	GAS	14123	14453	3308	2456	0	0	0	0	0	0	3130	14027	51,497
	PK	56.9	60.1	28.2	7.8	0.0	0.0	0.0	0.0	0.0	0.0	26.8	54.6	60.1
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	8333	7526	8333	8064	0	0	0	0	0	0	8064	8333	48,653
	PK	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2	11.2
3	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
3	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	8333	7526	8333	8064	0	0	0	0	0	0	8064	8333	48,653
	PK	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2	11.2
3	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	5580	5040	5580	5400	0	0	0	0	0	0	5400	5580	32,580
	PK	7.5	7.5	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5	7.5
4	BLR2MOD	WATERTUBE BOILER WITH HIGH-LOW FIRE												
		Bldgs. 1374, 75, 77, 79, 80 HW Equipment (BLR-2)												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5		WATERTUBE BOILER												
		Bldg. 1384 HW Equipment												
	GAS	668	672	234	40	0	0	0	0	0	0	196	676	2,485
	PK	1.8	1.9	2.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2.2	2.2
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	2727	2604	1008	213	0	0	0	0	0	0	896	2750	10,198
	PK	5.6	5.6	5.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.6

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO J - WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ5311	BOILER CONTROLS												
	ELEC	61	58	23	5	0	0	0	0	0	0	20	61	228
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
6	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	4314	4635	3322	3214	0	0	0	0	0	0	3214	4257	22,957
	PK	69.0	82.7	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	4.5	81.2	82.7
		Bldg. 1387 HW Equipment												
7		WATERTUBE BOILER												
	GAS	356	370	180	160	0	0	0	0	0	0	174	289	1,528
	PK	4.7	5.2	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.0	5.2	5.2
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	149	134	149	144	0	0	0	0	0	0	144	149	869
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
7	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	149	134	149	144	0	0	0	0	0	0	144	149	869
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
8		WATERTUBE BOILER												
	GAS	288	314	212	125	0	0	0	0	0	0	125	449	1,512
	PK	3.7	4.1	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.8	4.1
		Bldg. 1398 HW Equipment												
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	2753	2486	2753	2664	0	0	0	0	0	0	2664	2753	16,073
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
8	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO K1 - WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	41366	40032	41366	41366	40032	41366	0	0	245,529
	PK	0.0	0.0	0.0	0.0	55.6	55.6	55.6	55.6	55.6	55.6	0.0	0.0	55.6
1	EQ1008L	3-STG CENTRIFUGAL > 300 TONS												
	ELEC	0	0	0	0	165551	174355	204739	209519	169287	65609	0	0	989,061
	PK	0.0	0.0	0.0	0.0	286.9	298.2	303.4	308.0	297.4	254.7	0.0	0.0	309.0
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	38852	37598	38852	38852	37598	20589	0	0	212,341
	PK	0.0	0.0	0.0	0.0	52.2	52.2	52.2	52.2	52.2	52.2	0.0	0.0	52.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	1631	1771	2189	2265	1694	499	0	0	10,051
	PK	0.0	0.0	0.0	0.0	4.2	4.2	4.2	4.2	4.2	4.1	0.0	0.0	4.2



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO K1 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1008L	3-STG CENTRIFUGAL > 300 TONS												
	ELEC	0	0	0	0	50204	66124	98930	108845	60846	0	0	0	384,949
	PK	0.0	0.0	0.0	0.0	286.9	292.5	303.4	308.0	297.4	254.7	0.0	0.0	308.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	342	390	547	573	350	0	0	0	2,202
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	2357	11147	13982	0	0	0	0	27,486
	PK	0.0	0.0	0.0	0.0	320.2	324.3	332.3	335.7	327.8	56.6	0.0	0.0	335.7
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	656	1850	2432	0	0	0	0	4,939
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	9	51	66	0	0	0	0	126
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	0.1	0.0	0.0	1.7
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	1311	3695	4857	0	0	0	0	9,864
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
 ECO K1 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	986	2778	3651	0	0	0	0	7,414
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	44	124	163	0	0	0	0	331
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO K2 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	41366	40032	41366	41366	40032	41366	0	0	245,529
	PK	0.0	0.0	0.0	0.0	55.6	55.6	55.6	55.6	55.6	55.6	0.0	0.0	55.6
1	EQ1009													
		3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	0	0	0	0	180512	186691	219077	221699	178834	65491	0	0	1,052,304
	PK	0.0	0.0	0.0	0.0	313.0	313.0	313.0	313.0	313.0	313.0	0.0	0.0	313.0
1	EQ5100													
		COOLING TOWER FANS												
	ELEC	0	0	0	0	7748	11301	16888	20754	10394	0	0	0	67,085
	PK	0.0	0.0	0.0	0.0	38.2	43.5	47.4	52.2	44.1	23.6	0.0	0.0	52.2
1	EQ5100													
		COOLING TOWER FANS												
	WATER	0	0	0	0	1642	1781	2200	2274	1700	499	0	0	10,095
	PK	0.0	0.0	0.0	0.0	4.2	4.2	4.2	4.2	4.2	4.2	0.0	0.0	4.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO K2 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	0	0	0	0	47252	64018	96167	105683	57787	0	0	0	370,906
	PK	0.0	0.0	0.0	0.0	313.0	313.0	313.0	313.0	313.0	313.0	0.0	0.0	313.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	342	390	547	573	350	0	0	0	2,202
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	2357	11147	13982	0	0	0	0	27,486
	PK	0.0	0.0	0.0	0.0	320.2	324.3	332.3	335.7	327.8	56.6	0.0	0.0	335.7
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	656	1850	2432	0	0	0	0	4,939
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	9	51	66	0	0	0	0	126
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	0.1	0.0	0.0	1.7
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	1311	3695	4857	0	0	0	0	9,864
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4

## ECO K2 - WATERSIDE EQUIPMENT

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	986	2778	3651	0	0	0	0	7,414
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	44	124	163	0	0	0	0	331
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO K3 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	41366	40032	41366	41366	40032	41366	0	0	245,529
	PK	0.0	0.0	0.0	0.0	55.6	55.6	55.6	55.6	55.6	55.6	0.0	0.0	55.6
1	YSCRW22	YORK W.C. SCREW CHILLER												
	ELEC	0	0	0	0	201441	210184	235363	243388	204723	68088	0	0	1,163,188
	PK	0.0	0.0	0.0	0.0	337.4	349.2	354.8	359.5	348.4	304.7	0.0	0.0	359.5
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	38852	37598	38852	38852	37598	19537	0	0	211,288
	PK	0.0	0.0	0.0	0.0	52.2	52.2	52.2	52.2	52.2	52.2	0.0	0.0	52.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	1762	1844	2172	2284	1765	418	0	0	10,245
	PK	0.0	0.0	0.0	0.0	4.3	4.3	4.3	4.3	4.3	4.2	0.0	0.0	4.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO K3 - WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	YSCRW22	YORK W.C. SCREW CHILLER												
	ELEC	0	0	0	0	67437	74834	108025	120037	70811	17	0	0	441,162
	PK	0.0	0.0	0.0	0.0	337.4	348.0	354.8	359.5	348.4	304.7	0.0	0.0	359.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	12933	12337	17850	19430	11860	119	0	0	74,530
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	12933	12337	17850	19430	11860	119	0	0	74,530
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	434	414	599	652	398	4	0	0	2,501
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	11859	21721	30122	34502	18075	0	0	0	116,280
	PK	0.0	0.0	0.0	0.0	320.2	324.3	332.3	335.7	327.8	56.6	0.0	0.0	335.7
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	1238	2328	2313	2313	1701	0	0	0	9,892
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	64	117	159	181	97	0	0	0	617
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	0.1	0.0	0.0	1.7
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2473	4649	4619	4619	3397	0	0	0	19,757
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
 ECO K3 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	----- Monthly Consumption -----												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	1859	3494	3472	3472	2554	0	0	0	14,851
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	83	156	155	155	114	0	0	0	663
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO K4 - WATERSIDE EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	41366	40032	41366	41366	40032	41366	0	0	245,529
	PK	0.0	0.0	0.0	0.0	55.6	55.6	55.6	55.6	55.6	55.6	0.0	0.0	55.6
1		ENGINE DRIVEN CHILLER, 80 TONS												
	GAS	0	0	0	0	19367	20344	24481	25091	19702	7203	0	0	116,188
	PK	0.0	0.0	0.0	0.0	35.0	36.1	36.6	37.1	36.0	31.8	0.0	0.0	37.1
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	38852	37598	38852	38852	37598	20570	0	0	212,322
	PK	0.0	0.0	0.0	0.0	52.2	52.2	52.2	52.2	52.2	52.2	0.0	0.0	52.2
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	2091	2291	2863	2974	2182	632	0	0	13,033
	PK	0.0	0.0	0.0	0.0	5.5	5.5	5.6	5.6	5.6	5.3	0.0	0.0	5.6

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO K4 - WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	22171	0	0	131,597
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
1		HEATER FOR ENGINE DRIVEN CHILLER												
	ELEC	112	101	112	108	0	0	0	0	0	0	108	112	652
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
2		ENGINE DRIVEN CHILLER, 80 TONS												
	GAS	0	0	0	0	5236	7360	11141	12348	6449	0	0	0	42,534
	PK	0.0	0.0	0.0	0.0	35.0	35.6	36.6	37.1	36.0	31.8	0.0	0.0	37.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	10192	11622	16301	17075	10430	0	0	0	65,620
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	342	390	547	573	350	0	0	0	2,202
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2		HEATER FOR ENGINE DRIVEN CHILLER												
	ELEC	112	101	112	108	60	49	30	26	55	112	108	112	984
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
3	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	2357	11147	13982	0	0	0	0	27,486
	PK	0.0	0.0	0.0	0.0	320.2	324.3	332.3	335.7	327.8	56.6	0.0	0.0	335.7
3	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	656	1850	2432	0	0	0	0	4,939
	PK	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	0.0	0.0	14.9

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3

## ECO K4 - WATERSIDE EQUIPMENT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
3	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	9	51	66	0	0	0	0	126
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	0.1	0.0	0.0	1.7
3	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	1311	3695	4857	0	0	0	0	9,864
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
3	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	986	2778	3651	0	0	0	0	7,414
	PK	0.0	0.0	0.0	0.0	22.4	22.4	22.4	22.4	22.4	22.4	0.0	0.0	22.4
3	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	44	124	163	0	0	0	0	331
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO L - WATERSIDE EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	203729	184033	203907	197179	203818	197312	203685	203907	197179	203818	197090	202795	2,398,450
	PK	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6	941.6
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	HOTLD	2193	1981	2193	2123	0	0	0	0	0	0	2123	2193	12,806
	PK	2.9	2.9	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	2.9
1		HIGH EFFICIENCY MODULAR FIRETUBE BOIL.												
	GAS	9567	9866	3150	2331	0	0	0	0	0	0	3035	9491	37,439
	PK	20.0	20.0	14.5	3.7	0.0	0.0	0.0	0.0	0.0	0.0	11.9	20.0	20.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	4166	3763	4166	4032	0	0	0	0	0	0	4032	4166	24,326
	PK	5.6	5.6	5.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.6
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## 01 Card - Job Information

Project: 03-0185.06 EEAP BOILER-CHILLER STUDY  
 Location: FORT SAM HOUSTON, TEXAS  
 Client: CORPS OF ENGINEERS - FORT WORTH, TEXAS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: AREA 2200

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
SANANTON								

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	AREA 2200 EXISTING BUILDINGS

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	5	BLDG 2263	264	265	3	3	2.54	11			
15	15	DINING 2265	77	77	3	2.5	2.54	11			
20	20	BARR 2265	299	299	3	2.5	2.54	11			
25	25	ADMIN 2264	221	222	3	2.5	2.54	11			
30	30	BARR 2264	221	222	3	2.5	2.54	11			
35	35	ADMIN 2266	221	222	3	2.5	2.54	11			
40	40	BARR 2266	221	222	3	2.5	2.54	11			
45	45	ADMIN 2200	38	38.5	4	2	2.54	15.5			
50	50	CHAPEL 2200	117.5	117.5	4	2	1.80	38			
55	55	BLDG 2244	65	65	4	3	2.54	12			
60	60	ADMIN 2247	67	67	4	2	2.54	11			
65	65	CLASS 2247	43	43	4	2	2.54	11			
70	70	BLDG 2248	93.5	94	4	4	2.54	12			
75	75	BLDG 2250	93.5	94	4	4	2.54	12			
80	80	BLDG 2270	101.5	101.5	4	5	2.54	31			
85	85	BLDG 2272	75.5	75.5	4	2	2.54	12			
90	90	BLDG 2273	61.5	23	4	2	2.54	12			

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
5	78	50	78		70	70		ROOM	LIGHT30	YES	
15	78	50	78		70	70		ROOM	LIGHT30	NO	
20	78	50	78		70	70		ROOM	LIGHT30	YES	
25	78	50	78		70	70		ROOM	LIGHT30	YES	
30	78	50	78		70	70		ROOM	LIGHT30	YES	
35	78	50	78		70	70		ROOM	LIGHT30	YES	
40	78	50	78		70	70		ROOM	LIGHT30	YES	
45	78	50	78		70	70		ROOM	LIGHT30	YES	
50	78	50	78		70	70		ROOM	LIGHT30	YES	
55	78	50	78		70	70		ROOM	LIGHT30	YES	
60	78	50	78		70	70		ROOM	LIGHT30	YES	
65	78	50	78		70	70		ROOM	LIGHT30	YES	
70	78	50	78		70	70		ROOM	LIGHT30	YES	
75	78	50	78		70	70		ROOM	LIGHT30	YES	
80	78	50	78		70	70		ROOM	LIGHT30	YES	
85	78	50	78		70	70		ROOM	LIGHT30	YES	
90	78	50	78		70	70		ROOM	LIGHT30	YES	

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	164	164	.09	37		80	
20	1	NO	165	166	.09	37		80	
30	1	NO	165	166	.09	37		80	
40	1	NO	165	166	.09	37		80	
45	1	YES			0.12	20			
50	1	NO	81	81	0.05	37			
55	1	YES			0.14	37			
60	1	NO	55	53	0.14	37			
65	1	YES			0.14	37			
70	1	NO	66	66	0.14	37			
75	1	NO	66	66	0.14	37			
80	1	YES			0.20	37			
85	1	NO	60	60.5	0.14	37			
90	1	YES			0.14	37			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	1	924	11	.49	74	0				
5	2	414	11	.49	74	90				

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground		
Number	Number	Length	Height	U-Value	Constuc	Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	3	924	11	.49	74		180				
5	4	414	11	.49	74		270				
15	1	309	11	.41	94		0				
20	1	810	11	.41	94		0				
20	2	243	11	.41	94		90				
20	3	810	11	.41	94		180				
20	4	243	11	.41	94		270				
25	1	357	11	.41	94		0				
25	2	81	11	.41	94		90				
25	3	357	11	.41	94		180				
25	4	81	11	.41	94		270				
30	1	714	11	.41	94		0				
30	2	162	11	.41	94		90				
30	3	714	11	.41	94		180				
30	4	162	11	.41	94		270				
35	1	357	11	.41	94		0				
35	2	81	11	.41	94		90				
35	3	357	11	.41	94		180				
35	4	81	11	.41	94		270				
40	1	714	11	.41	94		0				
40	2	162	11	.41	94		90				
40	3	714	11	.41	94		180				
40	4	162	11	.41	94		270				
45	1	68	15.5	0.22	62		0				
45	2	41	15.5	0.22	62		90				
45	3	34	15.5	0.22	62		180				
45	4	34	15.5	0.22	62		270				
50	1	86	38	0.22	62		0				
50	2	59	38	0.22	62		90				
50	3	100	38	0.22	62		180				
50	4	61.5	38	0.22	62		270				
55	1	130	12	0.26	88		0				
55	2	38	12	0.26	88		90				
55	3	130	12	0.26	88		180				
55	4	38	12	0.26	88		270				
60	1	99	11	0.26	88		0				
60	2	53	11	0.26	88		90				
60	3	99	11	0.26	88		180				
60	4	53	11	0.26	88		270				
65	1	44	11	0.26	88		0				
65	2	43	11	0.26	88		90				
65	3	44	11	0.26	88		180				
65	4	43	11	0.26	88		270				
70	1	34	24	0.26	88		0				
70	2	145	24	0.26	88		90				
70	3	34	24	0.26	88		180				
70	4	145	24	0.26	88		270				



## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
75	1	34	24	0.26	88	0			
75	2	145	24	0.26	88	90			
75	3	34	24	0.26	88	180			
75	4	145	24	0.26	88	270			
80	1	58	38	0.30	88	0			
80	2	138	38	0.30	88	90			
80	3	66	38	0.30	88	180			
80	4	138	38	0.30	88	270			
85	1	76	12	0.26	88	0			
85	2	46.5	12	0.26	88	90			
85	3	76	12	0.26	88	180			
85	4	46.5	12	0.26	88	270			
90	1	61.5	12	0.26	88	0			
90	2	23	12	0.26	88	90			
90	3	61.5	12	0.26	88	180			
90	4	23	12	0.26	88	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance
				or No. of Windows	Glass U-Value				Solar Ret.	Visible Transmittance	
5	1	3	6	97	1.1	.67					
5	2			16	.63	1					
5	3			32	.57	1					
5	4			16	.63	1					
15	1	3	6	35	1.1	.67					
20	1	3	6	82	1.1	.67					
20	2	3	6	27	1.1	.67					
20	3	3	6	96	1.1	.67	3				
20	4	3	6	27	1.1	.67					
25	1	3	6	41	1.1	.67					
25	2	3	6	9	1.1	.67					
25	3	3	6	48	1.1	.67	3				
25	4	3	6	9	1.1	.67					
30	1	3	6	82	1.1	.67					
30	2	3	6	18	1.1	.67					
30	3	3	6	96	1.1	.67	3				
30	4	3	6	18	1.1	.67					
35	1	3	6	41	1.1	.67					
35	2	3	6	9	1.1	.67					
35	3	3	6	48	1.1	.67	3				
35	4	3	6	9	1.1	.67					
40	1	3	6	82	1.1	.67					
40	2	3	6	18	1.1	.67					
40	3	3	6	96	1.1	.67	3				

Card 25-----				Wall/Glass Parameters -----								
Room Number	Wall Number	Glass Length	Glass Width	Pct Glass or No. of		Shading Coefficient	External Shading Type	Internal Shading Type	Percent		Inside Visible Reflectance	
				Windows	Glass U-Value				Solar to Ret. Air	Visible Transmittance		
40	4	3	6	18	1.1	.67						
45	1	10	4	4	1.1	1						
45	2	10	4	2	1.1	1						
45	3	10	4	.5	1.1	1						
45	4	10	4	1	1.1	1						
50	1			5.8	1.1	1						
50	2			15.6	1.1	1						
50	3			.4	1.1	1						
50	4			16.7	1.1	1						
55	1	6	3	7	1.1	1	4					
55	2	6	3	3	1.1	1	4					
55	3	6	3	8	1.1	1	4					
55	4	6	3	4	1.1	1	4					
60	1			7.5	1.1	1						
60	2			2.4	1.1	1						
60	3			7.5	1.1	1						
60	4			20.6	1.1	1						
65	1	5.5	2.5	4	1.1	1						
65	2	5.5	2.5	3	1.1	1						
65	3	5.5	2.5	4	1.1	1						
70	1	6.5	3	2	1.1	1						
70	2	6.5	3	10	1.1	1	5					
70	3	6.5	3	2	1.1	1						
70	4	6.5	3	10	1.1	1	5					
75	1	6.5	3	2	1.1	1						
75	2	6.5	3	10	1.1	1	5					
75	3	6.5	3	2	1.1	1						
75	4	6.5	3	10	1.1	1	5					
85	1	6	3	21	1.1	1						
85	2	6	3	12	1.1	1						
85	3	6	3	13	1.1	1						
85	4	6	3	12	1.1	1						
90	1	6	4	4	1.1	1	5					
90	2	6	4	2	1.1	1	5					
90	3	6	4	4	1.1	1						
90	4	6	4	2	1.1	1	5					

Card 26----- Schedules -----										
Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	FSHOFFIC	FSHOFFIC								
15	FSHDINP	FSHDINL								
20	FSHBARRP	FSHBARRL								
25	FSHOFFIC	FSHOFFIC								
30	FSHBARRP	FSHBARRL								

Card 26----- Schedules -----										
Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
35	FSHOFFIC	FSHOFFIC								
40	FSHBARRP	FSHBARRL								
45	FSHOFFIC	FSHOFFIC								
50	FSHCHAPP	FSHCHAPL								
55	FSHLIB	AVAIL								
60	FSHOFFIC	FSHOFFIC								
65	FSHCLASP	FSHCLASL								
70	FSHOFFIC	FSHOFFIC								
75	FSHOFFIC	FSHOFFIC								
80	FSHTHEAP	FSHTHEAL								
85	FSHOFFIC	FSHOFFIC								
90	FSHOFFIC	FSHOFFIC								

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Ballast	Percent	--- Daylighting ---		
Number	Value	Units	Sensible	Latent	Value	Units	Type	Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	250	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2					
15	400	PEOPLE	275	275	1.1	WATT-SF	ASHRAE2					
20	215	PEOPLE	250	200	.8	WATT-SF	ASHRAE2					
25	40	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2					
30	350	PEOPLE	250	200	.8	WATT-SF	ASHRAE2					
35	40	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2					
40	350	PEOPLE	250	200	.8	WATT-SF	ASHRAE2					
45	5	PEOPLE	250	200	2	WATT-SF	ASHRAE2					
50	550	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
55	12	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2					
60	8	PEOPLE	250	200	1.6	WATT-SF	ASHRAE2					
65	30	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2					
70	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
75	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
80	950	PEOPLE	225	105	1.0	WATT-SF	ASHRAE2					
85	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					
90	3	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2					

Card 28----- Miscellaneous Equipment -----												
Room	Misc		Energy	Energy	Energy	Percent	Percent	Percent				
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional	
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path	
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
15	1	DIN. EQ.	1	WATT-SF	FSHDINL	NONE						
20	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE						
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
30	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE						

Card 28----- Miscellaneous Equipment -----												
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent				
Number	Number	Descrip	Consump	Consump	Schedule	of Load	Misc. Load	Misc. Sens	Radiant	Optional		
			Value	Units	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path		
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE						
40	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE						
45	1	OFFICE EQ	1.40	WATT-SF	FSHOFFIC	NONE						
50	1	CHAPEL EQ	0.25	WATT-SF	FSHCHAPL	NONE						
55	1	OFFICE EQ	2.7	WATT-SF	AVAIL	NONE						
60	1	OFFICE EQ	4.3	WATT-SF	FSHOFFIC	NONE						
65	1	CLASS EQ	0.5	WATT-SF	FSHCLASL	NONE						
70	1	OFFICE EQ	2.2	WATT-SF	FSHOFFIC	NONE						
75	1	OFFICE EQ	2.2	WATT-SF	FSHOFFIC	NONE						
85	1	OFFICE EQ	2.1	WATT-SF	FSHOFFIC	NONE						
90	1	OFFICE EQ	1.8	WATT-SF	FSHOFFIC	NONE						

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	20	CFM-P	20	CFM-P						
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	15	CFM-P	15	CFM-P						
55	20	CFM-P	20	CFM-P						
60	20	CFM-P	20	CFM-P						
65	15	CFM-P	15	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	15	CFM-P	15	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						

Card 31----- Partition Parameters -----									
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No
85	1	148.5	12	0.33	103	HRLYOADB			

Card 33----- External Shading -----

-----OVERHANG-----				-----VERTICAL FINS-----					
Shading Type	Height			Left Right Adjacent					
	Glass	Above	Projection	Glass	Projection	Projection	Projection	Projection	Building
	Height	Glass	Out	Width	Left	Out	Right	Out	Flag
	3	6	1	5					
4	6	2	3.5						
5	6.5	2	10						

----- System Section Alternative #1 -----

Card 39- System Alternative

Number	Description
1	AREA 2200 EXISTING AIRSIDE SYSTEMS

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System		Ventil					Fan
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	SZ						
2	BPMZ						
3	BPMZ						
4	BPMZ						
5	FC						
6	SZ						
7	SZ						
8	BPMZ						
9	BPMZ						
10	BPMZ						
11	BPMZ						
12	FC						
13	FC						

Card 41----- Zone Assignment -----

[illegible]

11

80

80

## Card 41----- Zone Assignment -----

## System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
12	85	85										
13	90	90										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.0										
2	1.0										
3	1.0										
4	1.0										
5	1.0										
6	1.0										
7	1.0										
8	1.0										
9	1.0										
10	1.0										
11	1.0										
12	1.0										
13	1.0										

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main	Auxiliary		
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
2	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
3	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
4	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
5					FTSAMHTG	FTSAMHTG	FTSAMHTG		
6					FTSAMHTG	FTSAMHTG	FTSAMHTG		
7					FTSAMHTG	FTSAMHTG	FTSAMHTG		
8					FTSAMHTG	FTSAMHTG	FTSAMHTG		
9	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
10	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
11	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
12	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		
13	FTSAMCLG				FTSAMHTG	FTSAMHTG	FTSAMHTG		

----- Equipment Section Alternative #1 -----





## Card 65----- Heating Load Assignment -----

Load All Coil

Assignment Reference	Loads To Heating Ref	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
2	4	5 6								
3	5	7 7								
4	6	8 8								
5	7	9 10								
6	8	11 11								
7	10	12 13								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc.	Demand Limit				
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	1				1	
2	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	2				2	
3	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	3				3	
4	BOILERWT	1	1.5	KW	831.7	MBH	1050	MBH						
5	BOILERWT	1	1.5	KW	112.2	MBH	150	MBH					5	
6	STEAMBLR	1			79.9	MBH	197.2	MBH						
7	BOILERWT	1	0.2	KW	679	MBH	900	MBH					6	
8	BOILERWT	1	2.2	KW	550	MBH	750	MBH	1					
9	BOILERWT	1	2.2	KW	550	MBH	750	MBH	2					
10	BOILERWT	1	3.7	KW	388	MBH	525	MBH						

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	TYPFAN						
2	TYPFAN						
3	TYPFAN						
4	TYPFAN						
5	TYPFAN						
6	TYPFAN						
7	TYPFAN						
8	TYPFAN						
9	TYPFAN						
10	TYPFAN						
11	TYPFAN						
12	TYPFAN						
13	TYPFAN						



## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO M - INSTALL EMS FOR HVAC EQUIPMENT

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	5	BLDG 2263	264	265	3	3	2.54	11			
15	15	DINING 2265	77	77	3	2.5	2.54	11			
20	20	BARR 2265	299	299	3	2.5	2.54	11			
25	25	ADMIN 2264	221	222	3	2.5	2.54	11			
30	30	BARR 2264	221	222	3	2.5	2.54	11			
35	35	ADMIN 2266	221	222	3	2.5	2.54	11			
40	40	BARR 2266	221	222	3	2.5	2.54	11			
45	45	ADMIN 2200	38	38.5	4	2	2.54	15.5			
50	50	CHAPEL 2200	117.5	117.5	4	2	1.80	38			
55	55	BLDG 2244	65	65	4	3	2.54	12			
60	60	ADMIN 2247	67	67	4	2	2.54	11			
65	65	CLASS 2247	43	43	4	2	2.54	11			
70	70	BLDG 2248	93.5	94	4	4	2.54	12			
75	75	BLDG 2250	93.5	94	4	4	2.54	12			
80	80	BLDG 2270	101.5	101.5	4	5	2.54	31			
85	85	BLDG 2272	75.5	75.5	4	2	2.54	12			
90	90	BLDG 2273	61.5	23	4	2	2.54	12			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
5	78	50	78		70	70		ROOM	LIGHT30	YES
15	78	50	78		70	70		ROOM	LIGHT30	NO
20	78	50	78		70	70		ROOM	LIGHT30	YES
25	78	50	78		70	70		ROOM	LIGHT30	YES
30	78	50	78		70	70		ROOM	LIGHT30	YES
35	78	50	78		70	70		ROOM	LIGHT30	YES
40	78	50	78		70	70		ROOM	LIGHT30	YES
45	78	50	78		70	70		ROOM	LIGHT30	YES
50	78	50	78		70	70		ROOM	LIGHT30	YES
55	78	50	78		70	70		ROOM	LIGHT30	YES
60	78	50	78		70	70		ROOM	LIGHT30	YES
65	78	50	78		70	70		ROOM	LIGHT30	YES
70	78	50	78		70	70		ROOM	LIGHT30	YES
75	78	50	78		70	70		ROOM	LIGHT30	YES

## Card 21----- Thermostat Parameters -----

	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
80	78	50	78		70	70		ROOM	LIGHT30	YES
85	78	50	78		70	70		ROOM	LIGHT30	YES
90	78	50	78		70	70		ROOM	LIGHT30	YES

## Card 22----- Roof Parameters -----

	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Room	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	NO	164	164	.09	37		80	
20	1	NO	165	166	.09	37		80	
30	1	NO	165	166	.09	37		80	
40	1	NO	165	166	.09	37		80	
45	1	YES			0.12	20			
50	1	NO	81	81	0.05	37			
55	1	YES			0.14	37			
60	1	NO	55	53	0.14	37			
65	1	YES			0.14	37			
70	1	NO	66	66	0.14	37			
75	1	NO	66	66	0.14	37			
80	1	YES			0.20	37			
85	1	NO	60	60.5	0.14	37			
90	1	YES			0.14	37			

## Card 24----- Wall Parameters -----

	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Room	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance	Multiplier
5	1	924	11	.49	74	0				
5	2	414	11	.49	74	90				
5	3	924	11	.49	74	180				
5	4	414	11	.49	74	270				
15	1	309	11	.41	94	0				
20	1	810	11	.41	94	0				
20	2	243	11	.41	94	90				
20	3	810	11	.41	94	180				
20	4	243	11	.41	94	270				
25	1	357	11	.41	94	0				
25	2	81	11	.41	94	90				
25	3	357	11	.41	94	180				
25	4	81	11	.41	94	270				
30	1	714	11	.41	94	0				
30	2	162	11	.41	94	90				
30	3	714	11	.41	94	180				

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Multiplier	Reflectance
30	4	162	11	.41	94	270				
35	1	357	11	.41	94	0				
35	2	81	11	.41	94	90				
35	3	357	11	.41	94	180				
35	4	81	11	.41	94	270				
40	1	714	11	.41	94	0				
40	2	162	11	.41	94	90				
40	3	714	11	.41	94	180				
40	4	162	11	.41	94	270				
45	1	68	15.5	0.22	62	0				
45	2	41	15.5	0.22	62	90				
45	3	34	15.5	0.22	62	180				
45	4	34	15.5	0.22	62	270				
50	1	86	38	0.22	62	0				
50	2	59	38	0.22	62	90				
50	3	100	38	0.22	62	180				
50	4	61.5	38	0.22	62	270				
55	1	130	12	0.26	88	0				
55	2	38	12	0.26	88	90				
55	3	130	12	0.26	88	180				
55	4	38	12	0.26	88	270				
60	1	99	11	0.26	88	0				
60	2	53	11	0.26	88	90				
60	3	99	11	0.26	88	180				
60	4	53	11	0.26	88	270				
65	1	44	11	0.26	88	0				
65	2	43	11	0.26	88	90				
65	3	44	11	0.26	88	180				
65	4	43	11	0.26	88	270				
70	1	34	24	0.26	88	0				
70	2	145	24	0.26	88	90				
70	3	34	24	0.26	88	180				
70	4	145	24	0.26	88	270				
75	1	34	24	0.26	88	0				
75	2	145	24	0.26	88	90				
75	3	34	24	0.26	88	180				
75	4	145	24	0.26	88	270				
80	1	58	38	0.30	88	0				
80	2	138	38	0.30	88	90				
80	3	66	38	0.30	88	180				
80	4	138	38	0.30	88	270				
85	1	76	12	0.26	88	0				
85	2	46.5	12	0.26	88	90				
85	3	76	12	0.26	88	180				
85	4	46.5	12	0.26	88	270				
90	1	61.5	12	0.26	88	0				
90	2	23	12	0.26	88	90				

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall			Ground		
				U-Value	Constuc Type	Direction	Wall Tilt	Wall Alpha	Reflectance Multiplier
90	3	61.5	12	0.26	88	180			
90	4	23	12	0.26	88	270			

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass			Shading Coefficient	External Shading Type	Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
				or No. of Windows	Glass U-Value	Shading						
5	1	3	6	97	1.1	.67						
5	2			16	.63	1						
5	3			32	.57	1						
5	4			16	.63	1						
15	1	3	6	35	1.1	.67						
20	1	3	6	82	1.1	.67						
20	2	3	6	27	1.1	.67						
20	3	3	6	96	1.1	.67		3				
20	4	3	6	27	1.1	.67						
25	1	3	6	41	1.1	.67						
25	2	3	6	9	1.1	.67						
25	3	3	6	48	1.1	.67		3				
25	4	3	6	9	1.1	.67						
30	1	3	6	82	1.1	.67						
30	2	3	6	18	1.1	.67						
30	3	3	6	96	1.1	.67		3				
30	4	3	6	18	1.1	.67						
35	1	3	6	41	1.1	.67						
35	2	3	6	9	1.1	.67						
35	3	3	6	48	1.1	.67		3				
35	4	3	6	9	1.1	.67						
40	1	3	6	82	1.1	.67						
40	2	3	6	18	1.1	.67						
40	3	3	6	96	1.1	.67		3				
40	4	3	6	18	1.1	.67						
45	1	10	4	4	1.1	1						
45	2	10	4	2	1.1	1						
45	3	10	4	.5	1.1	1						
45	4	10	4	1	1.1	1						
50	1			5.8	1.1	1						
50	2			15.6	1.1	1						
50	3			.4	1.1	1						
50	4			16.7	1.1	1						
55	1	6	3	7	1.1	1		4				
55	2	6	3	3	1.1	1		4				
55	3	6	3	8	1.1	1		4				
55	4	6	3	4	1.1	1		4				
60	1			7.5	1.1	1						

## Card 25----- Wall/Glass Parameters -----

Room Number	Wall Number	Glass Length	Glass Width	Pct Glass		Shading Coefficient	External		Internal Shading Type	Percent Solar to Ret. Air	Visible Transmittance	Inside Visible Reflectance
				or No. of Windows	Glass U-Value		Shading Type	Shading Type				
60	2			2.4	1.1	1						
60	3			7.5	1.1	1						
60	4			20.6	1.1	1						
65	1	5.5	2.5	4	1.1	1						
65	2	5.5	2.5	3	1.1	1						
65	3	5.5	2.5	4	1.1	1						
70	1	6.5	3	2	1.1	1						
70	2	6.5	3	10	1.1	1	5					
70	3	6.5	3	2	1.1	1						
70	4	6.5	3	10	1.1	1	5					
75	1	6.5	3	2	1.1	1						
75	2	6.5	3	10	1.1	1	5					
75	3	6.5	3	2	1.1	1						
75	4	6.5	3	10	1.1	1	5					
85	1	6	3	21	1.1	1						
85	2	6	3	12	1.1	1						
85	3	6	3	13	1.1	1						
85	4	6	3	12	1.1	1						
90	1	6	4	4	1.1	1	5					
90	2	6	4	2	1.1	1	5					
90	3	6	4	4	1.1	1						
90	4	6	4	2	1.1	1	5					

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat		Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
					Minimum						
5	FSHOFFIC	FSHOFFIC					DAYSCHED				
15	FSHDINP	FSHDINL					DNGFANSC				
20	FSHBARRP	FSHBARRL					BARRSCHD				
25	FSHOFFIC	FSHOFFIC					DAYSCHED				
30	FSHBARRP	FSHBARRL					BARRSCHD				
35	FSHOFFIC	FSHOFFIC					DAYSCHED				
40	FSHBARRP	FSHBARRL					BARRSCHD				
45	FSHOFFIC	FSHOFFIC					DAYSCHED				
50	FSHCHAPP	FSHCHAPL					CRCHSCHD				
55	FSHLIB	AVAIL									
60	FSHOFFIC	FSHOFFIC					DAYSCHED				
65	FSHCLASP	FSHCLASL					DAYSCHED				
70	FSHOFFIC	FSHOFFIC					DAYSCHED				
75	FSHOFFIC	FSHOFFIC					DAYSCHED				
80	FSHTHEAP	FSHTHEAL					THESCHED				
85	FSHOFFIC	FSHOFFIC					DAYSCHED				
90	FSHOFFIC	FSHOFFIC					DAYSCHED				

## Card 27----- People and Lights -----

Room Number	People				Lighting			Ballast Factor	Percent			--- Daylighting ---	
	Value	Units	Sensible	Latent	Value	Units	Type		Lighting	to Ret. Air	Reference Point 1	Reference Point 2	
5	250	PEOPLE	250	200	2.5	WATT-SF	ASHRAE2						
15	400	PEOPLE	275	275	1.1	WATT-SF	ASHRAE2						
20	215	PEOPLE	250	200	.8	WATT-SF	ASHRAE2						
25	40	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2						
30	350	PEOPLE	250	200	.8	WATT-SF	ASHRAE2						
35	40	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2						
40	350	PEOPLE	250	200	.8	WATT-SF	ASHRAE2						
45	5	PEOPLE	250	200	2	WATT-SF	ASHRAE2						
50	550	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
55	12	PEOPLE	250	200	1.7	WATT-SF	ASHRAE2						
60	8	PEOPLE	250	200	1.6	WATT-SF	ASHRAE2						
65	30	PEOPLE	250	200	2.3	WATT-SF	ASHRAE2						
70	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
75	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
80	950	PEOPLE	225	105	1.0	WATT-SF	ASHRAE2						
85	35	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						
90	3	PEOPLE	250	200	1.5	WATT-SF	ASHRAE2						

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump		Energy Consump		Schedule Code	Meter Code	Percent of Load		Percent Misc. Load		Percent Misc. Sens		Radiant Fraction	Optional Air Path
	Number	Descrip	Value	Units	Value	Units			Sensible	to Room	to Ret. Air	to Ret. Air	Sens	to Ret. Air		
5	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE										
15	1	DIN. EQ.	1	WATT-SF	FSHDINL	NONE										
20	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE										
25	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE										
30	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE										
35	1	COMPUTER	1	WATT-SF	FSHOFFIC	NONE										
40	1	T.V. ETC.	1	WATT-SF	FSHBARRL	NONE										
45	1	OFFICE EQ	1.40	WATT-SF	FSHOFFIC	NONE										
50	1	CHAPEL EQ	0.25	WATT-SF	FSHCHAPL	NONE										
55	1	OFFICE EQ	2.7	WATT-SF	AVAIL	NONE										
60	1	OFFICE EQ	4.3	WATT-SF	FSHOFFIC	NONE										
65	1	CLASS EQ	0.5	WATT-SF	FSHCLASL	NONE										
70	1	OFFICE EQ	2.2	WATT-SF	FSHOFFIC	NONE										
75	1	OFFICE EQ	2.2	WATT-SF	FSHOFFIC	NONE										
85	1	OFFICE EQ	2.1	WATT-SF	FSHOFFIC	NONE										
90	1	OFFICE EQ	1.8	WATT-SF	FSHOFFIC	NONE										

## Card 29----- Room Airflows -----

Room Number	Ventilation				Infiltration				Reheat Minimum	
	Cooling		Heating		Cooling		Heating		Value	Units
5	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						



Card 29-----Room Airflows-----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
20	20	CFM-P	20	CFM-P						
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	15	CFM-P	15	CFM-P						
55	20	CFM-P	20	CFM-P						
60	20	CFM-P	20	CFM-P						
65	15	CFM-P	15	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	15	CFM-P	15	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						

Card 31-----Partition Parameters-----									
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No
85	1	148.5	12	0.33	103	HRLYOADB			

Card 33----- External Shading -----										
-----OVERHANG-----				-----VERTICAL FINS-----						
		Height				Left		Right		Adjacent
Shading	Glass	Above	Projection	Glass	Projection	Projection	Projection	Projection	Projection	Building
Type	Height	Glass	Out	Width	Left	Out	Right	Out	Out	Flag
3	6	1	5							
4	6	2	3.5							
5	6.5	2	10							

----- System Section Alternative #2 -----

Card 39- System Alternative	
Number	Description
2	ECO M - AIRSIDE SYSTEMS

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System	Ventil						Fan
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	SZ						
2	BPMZ						
3	BPMZ						
4	BPMZ						
5	FC						
6	SZ						
7	SZ						
8	BPMZ						
9	BPMZ						
10	BPMZ						
11	BPMZ						
12	FC						
13	FC						

Card 41----- Zone Assignment

[illegible]

Card 42----- Fan SP and Duct Parameters-----

[illegible]

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
12	1.0										
13	1.0										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --			
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
4	DRY-BULB	65	100										
6	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main		Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech. Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity Coil
1	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG	
2	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG	
3	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG	
4	FTSAMCLG	AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG	
5						FTSAMHTG	FTSAMHTG	FTSAMHTG	
6		AVAIL				FTSAMHTG	FTSAMHTG	FTSAMHTG	
7						FTSAMHTG	FTSAMHTG	FTSAMHTG	
8						FTSAMHTG	FTSAMHTG	FTSAMHTG	
9	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG	
10	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG	
11	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG	
12	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG	
13	FTSAMCLG					FTSAMHTG	FTSAMHTG	FTSAMHTG	

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
8			OPSTART	OPSTOP					
9			OPSTART	OPSTOP					
10			OPSTART	OPSTOP					
11			OPSTART	OPSTOP					
12			OPSTART	OPSTOP					
13			OPSTART	OPSTOP					



## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond	Cond	Cond	Cond	Cond
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref	To Ref	@ HW
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type	Number	Temp
2	10									
5	10									
7	10									

## Card 65----- Heating Load Assignment -----

Load	All Coil											
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-		
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin
1	1	1	4									
2	4	5	6									
3	5	7	7									
4	6	8	8									
5	7	9	10									
6	8	11	11									
7	10	12	13									

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp				Energy		Seq	Switch					
Ref	Code	Of	Full Ld		Cap'y		Rate		Order	over	Hot	Misc.		Demand	
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Limit	Number
1	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	1			1			
2	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	2			2			
3	BLR2MOD	1	11.2	KW	2240	MBH	3000	MBH	3			3			
4	BOILERWT	1	1.5	KW	831.7	MBH	1050	MBH							
5	BOILERWT	1	1.5	KW	112.2	MBH	150	MBH				5			
6	STEAMBLR	1			79.9	MBH	197.2	MBH							
7	BOILERWT	1	0.2	KW	679	MBH	900	MBH				6			
8	BOILERWT	1	2.2	KW	550	MBH	750	MBH	1						
9	BOILERWT	1	2.2	KW	550	MBH	750	MBH	2						
10	BOILERWT	1	3.7	KW	388	MBH	525	MBH							

## Card 69----- Fan Equipment Parameters -----

System								
Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional	
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation	
1	TYPFAN							
2	TYPFAN							
3	TYPFAN							
4	TYPFAN							
5	TYPFAN							
6	TYPFAN							
7	TYPFAN							
8	TYPFAN							

## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
9	TYPFAN						
10	TYPFAN						
11	TYPFAN						
12	TYPFAN						
13	TYPFAN						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----			
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan
1	29.8										
7	2.2										
9	5.2										
10	5.2										
11	14.9										
13	0.6										

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	PIPE-PUMP HT LOS	31.8	TONS	FTSAMCLG	CHILL-LD	1			
2	PIPE-PUMP HT LOS	1.7	TONS	FTSAMCLG	CHILL-LD	2			
3	PIPE-PUMP HT LOS	0.3	TONS	FTSAMCLG	CHILL-LD	3			
4	PIPE-PUMP HT LOS	0.4	TONS	FTSAMCLG	CHILL-LD	4			
5	PIPE-PUMP HT LOS	1.7	TONS	FTSAMCLG	CHILL-LD	5			
6	PIPE-PUMP HT LOS	1.4	TONS	FTSAMCLG	CHILL-LD	6			
7	PIPE-PUMP HT LOS	1.5	TONS	FTSAMCLG	CHILL-LD	7			
8	PIPE LOSS	130.7	MBH	FTSAMHTG	HOT-LD	1			
9	PIPE LOSS	18.1	MBH	FTSAMHTG	HOT-LD	4			
10	PIPE LOSS	6.1	MBH	FTSAMHTG	HOT-LD	6			
11	PIPE LOSS	9.3	MBH	FTSAMHTG	HOT-LD	7			
12	PIPE LOSS	27.7	MBH	FTSAMHTG	HOT-LD	8			
13	PIPE LOSS	5.9	MBH	FTSAMHTG	HOT-LD	10			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy		Energy		Number			
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Percent	Low Spd	Low Spd
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Airflow	Energy	Energy
									Low Spd	Value	Units
1	EQS100			29.8	KW	T-WATER	CTOWER	2			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy		Energy		Number		Percent		Low Spd		Low Spd	
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy				
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units				
2	EQ5200			1.5	KW	T-WATER	CNDFAN	1							
3	EQ5200			2.2	KW	T-WATER	CNDFAN	1							

## Card 75----- Miscellaneous Accessory -----

#1					#2					#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched		
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code		
1	EQ5013	.56	KW											
2	EQ5013	.56	KW											
3	EQ5013	.56	KW											
4	EQ5001	1.5	KW											
5	EQ5020	0.1	KW											
6	EQ5020	0.3	KW											

## ----- Load Section Alternative #3 -----

## Card 19- Load Alternative -

Number	Description
3	ECO N - EXISTING BUILDINGS

## Card 20----- General Room Parameters -----

Zone			Acoustic					Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	
5	5	BLDG 2263	264	265	3	3	2.54	11			
15	15	DINING 2265	77	77	3	2.5	2.54	11			
20	20	BARR 2265	299	299	3	2.5	2.54	11			
25	25	ADMIN 2264	221	222	3	2.5	2.54	11			
30	30	BARR 2264	221	222	3	2.5	2.54	11			
35	35	ADMIN 2266	221	222	3	2.5	2.54	11			
40	40	BARR 2266	221	222	3	2.5	2.54	11			
45	45	ADMIN 2200	38	38.5	4	2	2.54	15.5			
50	50	CHAPEL 2200	117.5	117.5	4	2	1.80	38			
55	55	BLDG 2244	65	65	4	3	2.54	12			
60	60	ADMIN 2247	67	67	4	2	2.54	11			
65	65	CLASS 2247	43	43	4	2	2.54	11			
70	70	BLDG 2248	93.5	94	4	4	2.54	12			
75	75	BLDG 2250	93.5	94	4	4	2.54	12			
80	80	BLDG 2270	101.5	101.5	4	5	2.54	31			
85	85	BLDG 2272	75.5	75.5	4	2	2.54	12			

## ----- Equipment Section Alternative #3 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Time of Day	Elec Consump	Elec Demand	Demand	Temperature	Demand Limit
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
3				ECO N1 - WATERSIDE SYSTEMS		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	13								

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	Units	Value	Units	Value	Units	Value	Units	Order	Seq	Limit
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1008S	1	270	TONS	154	KW					1		
2	EQ1008L	1	545	TONS	300	KW					2		

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	29.8	KW	14.9	KW			1		1	
2	29.8	KW	29.8	KW			1		2	

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Schedule	Energy	Equip	Demand	Entering	Leaving
Utility	Utility	Demand	Demand	Code	Type	Reference	Limiting	Temp	Temp
Number	Descrip	Value	Units			Number	Number		
1	DISTRIBUTION LOS	38.8	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	4.8	TONS	FTSAMHTG	CHILL-LD	1			

## Card 72-- Switchover Controls -----

Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	270	TONS		



Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy		Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			
2	EQ5100			18.6	KW	T-WATER	CTOWER	1			

----- Equipment Section Alternative #4 -----

Card 59----- Equipment Description / TOD Schedules -----

Elec Consump		Elec Demand		Demand		---- Demand Limit ---	
Alternative	Time of Day	Time of Day	Limit				Temperature
Number	Schedule	Schedule	Max KW	Alternative Description		Schedule	Drift
4				ECO N2 - WATERSIDE SYSTEMS			

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	13								

Card 62----- Cooling Equipment Parameters -----

Cool Equip		Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand	
Ref	Code	Of	--Capacity--	----Energy----		--Capacity--	----Energy----		Order	Seq	Limit		
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1009	1	270	TONS	154	KW					1		
2	EQ1009	1	545	TONS	300	KW					2		

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	29.8	KW	14.9	KW			1		1	
2	29.8	KW	29.8	KW			1		2	

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Energy		Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	38.8	TONS	FTSAMCLG	CHILL-LD	1			
2	DISTRIBUTION LOS	4.8	TONS	FTSAMHTG	CHILL-LD	1			

## Card 72-- Switchover Controls -----

			Outside	
Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	270	TONS		

## Card 74----- Condenser / Cooling Tower Parameters -----

	Cooling			Energy	Energy			Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			
2	EQ5100			18.6	KW	T-WATER	CTOWER	1			

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump	Elec Demand	Demand	Limit	Temperature	Drift
1						

ECO N3 - WATERSIDE SYSTEMS

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1		1	13										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	Seq	Demand
Ref Code	Of	Order	Seq
Num Name	Units	Num	Type
1 YSCRW22	1 270 TONS	1	
2 YSCRW22	1 545 TONS	2	

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	29.8 KW	14.9 KW		
2	29.8 KW	29.8 KW		

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip	Demand
Utility	Utility	Demand	Demand	Schedule	Energy
Number	Descrip	Value	Units	Code	Type
1	DISTRIBUTION LOS	38.8	TONS	FTSAMCLG	CHILL-LD
2	DISTRIBUTION LOS	4.8	TONS	FTSAMHTG	CHILL-LD

## Card 72-- Switchover Controls -----

Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	270	TONS		

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd	
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			14.9	KW	T-WATER	CTOWER	1			
2	EQ5100			18.6	KW	T-WATER	CTOWER	1			

----- Equipment Section Alternative #2 -----

Card 59----- Equipment Description / TOD Schedules -----

Elec Consump		Elec Demand	Demand	---- Demand Limit ---	
Alternative	Time of Day	Time of Day	Limit		Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule Drift
2				ECO N4 - WATERSIDE SYSTEMS	

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	13								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand				
Ref	Code	Of	--Capacity--	Value	Units	Value	Units	Value	Units	Value	Units	Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EDC80TON	1	815	TONS	5379	MBH							1		

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-								
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	44.7	KW	44.7	KW							1	

Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly	Equip		Demand				
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving	
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp	
1	DISTRIBUTION LOS	38.8	TONS	FTSAMCLG	CHILL-LD	1				
2	DISTRIBUTION LOS	4.8	TONS	FTSAMHTG	CHILL-LD	1				

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling	Energy	Energy	Number	Percent	Low Spd	Low Spd
---------	--------	--------	--------	---------	---------	---------

Tower Ref	Tower Code	Capacity Value	Capacity Units	Consump Value	Consump Units	Fluid Type	Tower Type	Of Cells	Airflow Low Spd	Energy Value	Energy Units
1	EQ5100			37.2	KW	T-WATER	CTOWER	1	50	18.6	KW

## ----- Equipment Section Alternative #3 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	Time of Day	Time of Day	Limit	Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift	
3				ECO 0 - WATERSIDE SYSTEMS			

## Card 65----- Heating Load Assignment -----

Load All Coil

Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	1 13								

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc. Acc.	Cogen	Demand Limit			
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BOILHEFT	1	11.2	KW	1830	MBH	2000	MBH	1					
2	BOILHEFT	1	11.2	KW	1830	MBH	2000	MBH	2					
3	BOILHEFT	1	11.2	KW	1830	MBH	2000	MBH	3					

## Card 71----- Base Utility Parameters -----

Base Utility	Base Utility	Hourly Demand	Hourly Demand	Schedule Code	Energy Type	Equip Reference	Demand Limiting	Entering Temp	Leaving Temp
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	DISTRIBUTION LOS	197.8	MBH	FTSAMHTG	HOT-LD	1			

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
BARRSCHD COOLING FAN SCHEDULE CODE FOR BARACKS  
CRCHSCHD COOLING FAN SCHEDULE CODE FOR CHURCH  
DAYSCHED COOLING FAN SCHEDULE CODE  
DNGFANSC COOLING FAN SCHEDULE CODE FOR DINING  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHCHAPL F.S.H. CHAPEL LIGHTING SCHEDULE  
FSHCHAPP F.S.H. CHAPEL PEOPLE SCHEDULE  
FSHCLASL F.S.H. CLASSROOM LIGHTING SCHEDULE  
FSHCLASP F.S.H. CLASSROOM PEOPLE SCHEDULE  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSHLIB F.S.H. LIBRARY PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FSHTHEAL F.S.H. THEATRE LIGHTING SCHEDULE  
FSHTHEAP F.S.H. THEATRE PEOPLE SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE  
THESCHED COOLING FAN SCHEDULE CODE FOR THEATRE

## System:

BFMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
SZ SINGLE ZONE SYSTEM

## Equipment:

## Cooling:

ACC1 TYPICAL AIR COOLED RECIP CHILLER  
ACC2 TYPICAL AIR COOLED RECIP CHILLER  
EQ1001L 2-STG CENTRIFUGAL CHILLER >550 TONS  
EQ1008L 3-STG CENTRIFUGAL > 300 TONS  
EQ1008S 3-STG CENTRIFUGAL < 300 TONS  
EQ1009 3-STG CTV WITH VARIABLE FREQUENCY DRV  
EQ1130L WTR-CLD CONDENSER COMPRESSOR > 30 TONS  
EQ1172L AIR-CLD COND COMP >55 TONS

## Heating:

BLR2MOD WATERTUBE BOILER WITH HIGH-LOW FIRE  
BOILERWT WATERTUBE BOILER  
STEAMBLR STEAM BOILER

## Fan:

TYPFAN GENERIC FAN

## Tower:

EQ5100 COOLING TOWER FANS  
EQ5200 CONDENSER FANS

## Misc:

EQ5001 CHILLED WATER PUMP - CONSTANT VOLUME  
EQ5013 WATER CIRCULATING PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP

Schedule Name: AVAIL

Project: AVAILABLE (100)

Location:

Client: VERSION 3.0

Program User: C.D.S. MARKETING

Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24



Schedule Name: BARRSCHD

Project: COOLING FAN SCHEDULE CODE FOR B

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
8	0
17	100
24	

Schedule Name: CRCHSCHD

Project: COOLING FAN SCHEDULE CODE FOR C

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0 0

7 100

16 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----

0 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0 0

6 100

16 0

24

Schedule Name: DAYSCHED

Project: COOLING FAN SCHEDULE CODE

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	0
6	100
17	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
12	100
16	0
24	

Schedule Name: DNGFANSC

Project: COOLING FAN SCHEDULE CODE FOR D

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: SAT

Hour Util Percent

-----

0	0
4	100
21	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0	0
12	100
16	0
24	

Schedule Name: FSHBARRL  
Project: F.S.H. BARRACKS LIGHT\MISC. SCH  
Location: F.S.H. - SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHT

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	5
17	80
22	5
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	5
8	50
22	5
24	

Schedule Name: FSHBARRP  
Project: F.S.H. BARRACKS PEOPLE SCHEDULE  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR BARRACKS

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		100
8		0
17		80
22		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		50
24		

Schedule Name: FSHCHAPL  
Project: F.S.H. CHAPEL LIGHTING SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util Percent
0	0
19	100
20	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour	Util Percent
0	0
9	100
12	0
24	

Schedule Name: FSHCHAPP  
Project: FSH CHAPEL PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
19 15  
20 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
9 80  
12 0  
24



Schedule Name: FSHCLASL  
Project: F.S.H. CLASSROOM LIGHTING SCHE  
Location: EEAP BOILER CHILLER STUDY  
Client: CORP OF ENGINEERS, PUBLIC WAOEKS  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	0
8	100
10	0
13	100
14	0
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	0
24	

Schedule Name: FSHCLASP  
Project: F.S.H CLASSROOM PEOPLE SCHEDULE  
Location: EEAP BOILER CHILLER STUDY  
Client: CORP OF ENGINEERS, PUBLIC WORKS  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
10 0  
13 50  
14 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHDINL  
Project: F.S.H. BARRACKS DINING LIGHTING  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
5 100  
19 0  
24

Schedule Name: FSHDINP  
Project: F.S.H. BARRACKS DINING PEOPLE S  
Location: SAN ANTONIO TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE SCHEDULE FOR DINING

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
6 100  
9 0  
11 100  
14 0  
17 100  
19 0  
24

Schedule Name: FSHLIB  
Project: F.S.H. LIBRARY PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

-----  
0 15  
7 100  
17 60  
23 15  
24

Schedule Name: FSHOFFIC  
Project: F.S.H. OFFICE INTERNAL LOAD SCH  
Location: F.S.H. SAN ANTONIO, TEXAS  
Client: CORPS OF ENGRS,PUBLIC WORKS DIRE  
Program User: HUITT ZOLLARS, INC. - JTC,  
Comments: ALL INTERNAL LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	0	
8	100	
12	10	
13	100	
17	0	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	0	
24		

Schedule Name: FSHTHEAL  
Project: F.S.H. THEATRE LIGHTING SCHEDUL  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 100  
10 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
19 100  
21 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: FSHTHEAP  
Project: F.S.H. THEATRE PEOPLE SCHEDULE  
Location: EEAP BOILER  
Client: CORP OF ENGINEERS, FSH  
Program User: HUITT-ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
8 25  
10 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----  
0 0  
19 75  
21 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24



Schedule Name: FTSAMCLG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: CHILLER SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0		0
24		

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0		100
24		

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0		0
24		

Schedule Name: FTSAMHTG  
Project: EEAP BOILER  
Location: FORT SAM HOUSTON, SAN ANTONIO,  
Client: CORP OF ENGINEERS - FORT WORTH,  
Program User: HUITT-ZOLLARS, INC.  
Comments: BOIELR SCHEDULE

Starting Month: JAN Ending Month: APR  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	100	
24		

Starting Month: MAY Ending Month: OCT  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	0	
24		

Starting Month: NOV Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour	Util	Percent
0	100	
24		

Schedule Name: OPSTART

Project: OPTIMUM START COOLING FAN SCHED

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
6	100
7	0
24	

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0	0	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0	0	
16	100	
17	0	
24		

Schedule Name: THESCHED

Project: COOLING FAN SCHEDULE CODE FOR T

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: WKDY

Hour Util Percent

-----

0 0

6 100

14 0

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SAT

Hour Util Percent

-----

0 0

14 100

24

Starting Month: JAN Ending Month: DEC

Starting Day Type: SUN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

## Utility Description Reference Table

-----

## Schedules:

AVAIL AVAILABLE (100%)  
FSHBARRL F.S.H. BARRACKS LIGHT\MISC. SCHEDULE  
FSHBARRP F.S.H. BARRACKS PEOPLE SCHEDULE  
FSHCHAPL F.S.H. CHAPEL LIGHTING SCHEDULE  
FSHCHAPP F.S.H. CHAPEL PEOPLE SCHEDULE  
FSHCLASL F.S.H. CLASSROOM LIGHTING SCHEDULE  
FSHCLASP F.S.H. CLASSROOM PEOPLE SCHEDULE  
FSHDINL F.S.H. BARRACKS DINING LIGHTING SCHED  
FSHDINP F.S.H. BARRACKS DINING PEOPLE SCHED  
FSHLIB F.S.H. LIBRARY PEOPLE SCHEDULE  
FSHOFFIC F.S.H. OFFICE INTERNAL LOAD SCHEDULE  
FSHTHEAL F.S.H. THEATRE LIGHTING SCHEDULE  
FSHTHEAP F.S.H. THEATRE PEOPLE SCHEDULE  
FTSAMCLG EEAP BOILER/CHILLER STUDY  
FTSAMHTG EEAP BOILER/CHILLER STUDY

## System:

BPMZ BYPASS MULTIZONE SYSTEM  
FC FAN COIL SYSTEM  
SZ SINGLE ZONE SYSTEM

## Equipment:

## Cooling:

EDC80TON ENGINE DRIVEN CHILLER, 80 TONS  
YSCRW22 YORK W.C. SCREW CHILLER

## Heating:

BOILHEFT HIGH EFFICIENCY MODULAR FIRETUBE BOIL.

## Tower:

EQ5100 COOLING TOWER FANS

```
*****
*****
**                                     **
**          T R A C E    6 0 0    A N A L Y S I S          **
**                                     **
**          by  HUITT & ZOLLARS          **
**                                     **
*****
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FORT SAM HOUSTON, TEXAS  
CORPS OF ENGINEERS - FORT WORTH, TEXAS  
HUITT-ZOLLARS, INC.  
AREA 2200

Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 10:29:16 2/27/96  
Dataset Name: FSH2200 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
AREA 2200 EXISTING AIRSIDE SYSTEMS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	49.6	57	4,806	-306,983	36	1,143	21,697.2	0	0	0.0	0	0
5 - 10	99.2	4	319	-613,967	31	984	43,394.4	0	0	0.0	0	0
10 - 15	148.8	5	427	-920,950	14	463	65,091.6	0	0	0.0	0	0
15 - 20	198.4	3	257	-1,227,933	8	262	86,788.8	0	0	0.0	0	0
20 - 25	248.0	3	279	-1,534,917	1	41	108,486.0	0	0	0.0	0	0
25 - 30	297.6	3	224	-1,841,900	2	79	130,183.2	0	0	0.0	0	0
30 - 35	347.1	4	365	-2,148,884	1	33	151,880.4	0	0	0.0	0	0
35 - 40	396.7	4	357	-2,455,867	1	23	173,577.7	0	0	0.0	0	0
40 - 45	446.3	4	362	-2,762,850	0	12	195,274.8	0	0	0.0	0	0
45 - 50	495.9	4	317	-3,069,834	1	31	216,972.1	0	0	0.0	0	0
50 - 55	545.5	4	317	-3,376,817	1	41	238,669.3	0	0	0.0	0	0
55 - 60	595.1	3	233	-3,683,801	3	90	260,366.5	0	0	0.0	0	0
60 - 65	644.7	1	43	-3,990,785	0	10	282,063.8	0	0	0.0	0	0
65 - 70	694.3	1	66	-4,297,768	0	0	303,760.9	0	0	0.0	0	0
70 - 75	743.9	0	0	-4,604,751	0	0	325,458.1	0	0	0.0	0	0
75 - 80	793.5	0	0	-4,911,734	0	0	347,155.3	0	0	0.0	0	0
80 - 85	843.1	0	0	-5,218,718	0	0	368,852.5	0	0	0.0	0	0
85 - 90	892.7	0	0	-5,525,702	0	0	390,549.7	0	0	0.0	0	0
90 - 95	942.2	0	0	-5,832,684	0	0	412,247.0	0	0	0.0	0	0
95 - 100	991.8	0	0	-6,139,668	0	0	433,944.2	100	8,760	0.0	0	0
Hours Off	0.0	0	388	0	0	5,548	0.0	0	0	0.0	0	8,760



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	102756	92885	108274	98504	105515	104064	99955	108274	98504	105515	98587	99955	1,222,789
	PK	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	23659	22896	23659	23659	22896	23659	0	0	140,429
	PK	0.0	0.0	0.0	0.0	31.8	31.8	31.8	31.8	31.8	31.8	0.0	0.0	31.8
2		BASE UTILITY												
	CHILLD	0	0	0	0	1265	1224	1265	1265	1224	1265	0	0	7,507
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	1.7
3		BASE UTILITY												
	CHILLD	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
4		BASE UTILITY												
	CHILLD	0	0	0	0	298	288	298	298	288	298	0	0	1,766
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	1265	1224	1265	1265	1224	1265	0	0	7,507
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	1.7
6		BASE UTILITY												
	CHILLD	0	0	0	0	1042	1008	1042	1042	1008	1042	0	0	6,182
	PK	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	1.4
7		BASE UTILITY												
	CHILLD	0	0	0	0	1116	1080	1116	1116	1080	1116	0	0	6,624
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
8		BASE UTILITY												
	HOTLD	972	878	972	941	0	0	0	0	0	0	941	972	5,678
	PK	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3
9		BASE UTILITY												
	HOTLD	135	122	135	130	0	0	0	0	0	0	130	135	786
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
10		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
11		BASE UTILITY												
	HOTLD	69	62	69	67	0	0	0	0	0	0	67	69	404
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
12		BASE UTILITY												
	HOTLD	206	186	206	199	0	0	0	0	0	0	199	206	1,203
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
13		BASE UTILITY												
	HOTLD	44	40	44	42	0	0	0	0	0	0	42	44	256
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ1001L	2-STG CENTRIFUGAL CHILLER >550 TONS												
	ELEC	0	0	0	0	132626	161610	191719	198550	153830	70218	0	0	908,553
	PK	0.0	0.0	0.0	0.0	538.1	573.9	594.1	600.1	581.7	410.6	0.0	0.0	600.1
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	10942	0	0	120,368
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	592	734	879	905	686	292	0	0	4,088
	PK	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.1	0.0	0.0	2.6
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	55502	53712	55502	55502	53712	55502	0	0	329,433
	PK	0.0	0.0	0.0	0.0	74.6	74.6	74.6	74.6	74.6	74.6	0.0	0.0	74.6
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	27751	26856	27751	27751	26856	27751	0	0	164,717
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	363	2777	14095	20980	29371	29797	17655	3088	187	0	118,315
	PK	28.3	28.3	36.8	54.5	75.0	78.8	81.6	81.0	75.7	49.6	36.3	28.3	81.6
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	253	605	1637	1584	1637	1637	1584	1637	132	0	10,705
	PK	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	115	275	744	720	744	744	720	744	60	0	4,866
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	EQ1172L	AIR-CLD COND COMP >55 TONS												
	ELEC	2730	2187	4913	6794	9935	11277	13167	13023	10529	6695	4766	2772	88,789
	PK	13.9	13.4	17.0	19.7	24.2	26.9	29.2	29.0	25.8	20.0	16.7	13.6	29.2
3	EQ5200	CONDENSER FANS												
	ELEC	135	103	311	515	781	899	1144	1042	851	483	301	140	6,705
	PK	0.7	0.6	1.3	1.6	1.9	2.1	2.9	2.9	2.0	1.7	1.3	0.7	2.9
3	EQ5313	CONTROLS												
	ELEC	167	151	223	216	223	216	223	223	216	223	216	186	2,485
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
4	EQ1130L	WTR-CLD CONDENSER COMPRESSOR > 30 TONS												
	ELEC	994	679	2328	4656	9165	11128	13153	13574	10159	4399	1910	774	72,917
	PK	19.8	19.3	25.5	30.2	34.2	34.7	35.5	35.8	35.0	29.1	25.5	20.3	35.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
4	EQ5200	CONDENSER FANS												
	ELEC	36	23	94	185	359	437	547	533	397	174	77	28	2,891
	PK	0.9	0.8	1.2	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.2	0.9	1.5
4	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	158	114	304	525	1116	1080	1116	1116	1080	1116	234	120	8,079
	PK	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
4	EQ5302	CONTROLS												
	ELEC	10	8	20	35	74	72	74	74	72	74	16	8	539
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	18491	22575	26839	27081	19690	8207	0	0	122,882
	PK	0.0	0.0	0.0	0.0	60.6	67.0	72.2	71.5	62.5	47.4	0.0	0.0	72.2
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2232	2160	2232	2232	2160	2232	0	0	13,248
	PK	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0	3.0
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1116	1080	1116	1116	1080	1116	0	0	6,624
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
6	EQ1130L	WTR-CLD CONDENSER COMPRESSOR > 30 TONS												
	ELEC	0	0	0	0	14646	22640	32403	34136	19298	2100	0	0	125,222
	PK	0.0	0.0	0.0	0.0	80.7	82.6	83.7	84.5	82.6	45.0	0.0	0.0	84.5
6	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	328	544	854	847	449	41	0	0	3,063
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	1.1	0.0	0.0	2.2
6	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
6	EQ5302	CONTROLS												
	ELEC	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6		STEAM BOILER												
	GAS	426	391	127	108	0	0	0	0	0	0	133	390	1,576
	PK	1.8	1.9	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.8	1.9
6	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7		WATERTUBE BOILER												
	GAS	392	364	97	89	0	0	0	0	0	0	115	380	1,437
	PK	2.4	2.5	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	2.5
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	94	88	75	72	0	0	0	0	0	0	76	97	501
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
7	EQ5311	BOILER CONTROLS												
	ELEC	59	55	47	45	0	0	0	0	0	0	47	61	313
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	223	202	223	216	0	0	0	0	0	0	216	223	1,303
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
8		WATERTUBE BOILER												
	GAS	3603	3489	1494	505	0	0	0	0	0	0	1420	3445	13,956
	PK	7.5	7.5	4.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0	4.6	7.5	7.5
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
8	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
AREA 2200 EXISTING WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
9		WATERTUBE BOILER												
	GAS	0	19	0	0	0	0	0	0	0	0	0	5	25
	PK	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4
9	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	123	0	0	0	0	0	0	0	0	0	68	191
	PK	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2
9	EQ5311	BOILER CONTROLS												
	ELEC	0	7	0	0	0	0	0	0	0	0	0	4	11
	PK	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
10		WATERTUBE BOILER												
	GAS	309	290	82	58	0	0	0	0	0	0	94	282	1,115
	PK	1.6	1.6	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.6	1.6
10	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1706	1695	1436	1332	0	0	0	0	0	0	1462	1750	9,380
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
10	EQ5311	BOILER CONTROLS												
	ELEC	58	57	48	45	0	0	0	0	0	0	49	59	317
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

```
*****  
*****  
**  
**          T R A C E    6 0 0    A N A L Y S I S          **  
**  
**          by  HUITT & ZOLLARS          **  
**  
*****  
*****
```

03-0185.06 EEAP BOILER-CHILLER STUDY  
FORT SAM HOUSTON, TEXAS  
CORPS OF ENGINEERS - FORT WORTH, TEXAS  
HUITT-ZOLLARS, INC.  
AREA 2200

Weather File Code:

Location: SAN ANTONIO, TEXAS  
Latitude: 29.0 (deg)  
Longitude: 98.0 (deg)  
Time Zone: 6  
Elevation: 792 (ft)  
Barometric Pressure: 29.0 (in. Hg)

Summer Clearness Number: 0.90  
Winter Clearness Number: 0.90  
Summer Design Dry Bulb: 97 (F)  
Summer Design Wet Bulb: 76 (F)  
Winter Design Dry Bulb: 30 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0738 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 1.0818 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,761.9 (Btu-min./hr/cuft)  
Enthalpy Factor: 4.4255 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 15:25:22 2/27/96  
Dataset Name: FSH2200 .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
ECO M - AIRSIDE SYSTEMS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	49.6	54	4,561	-351,412	33	866	21,669.2	4	317	0.0	0	0
5 - 10	99.1	4	335	-702,824	23	587	43,338.4	3	248	0.0	0	0
10 - 15	148.7	3	214	-1,054,235	16	419	65,007.6	0	0	0.0	0	0
15 - 20	198.3	2	160	-1,405,647	6	166	86,676.8	0	0	0.0	0	0
20 - 25	247.9	3	284	-1,757,059	8	201	108,346.0	0	0	0.0	0	0
25 - 30	297.4	5	432	-2,108,471	9	229	130,015.2	0	0	0.0	0	0
30 - 35	347.0	4	342	-2,459,883	2	51	151,684.4	32	2,774	0.0	0	0
35 - 40	396.6	6	485	-2,811,294	2	45	173,353.6	25	2,197	0.0	0	0
40 - 45	446.1	7	581	-3,162,707	0	0	195,022.7	0	0	0.0	0	0
45 - 50	495.7	4	355	-3,514,118	0	3	216,692.0	1	105	0.0	0	0
50 - 55	545.3	2	166	-3,865,530	0	0	238,361.1	1	71	0.0	0	0
55 - 60	594.9	4	297	-4,216,943	0	0	260,030.3	1	76	0.0	0	0
60 - 65	644.4	1	81	-4,568,354	0	0	281,699.6	11	956	0.0	0	0
65 - 70	694.0	1	43	-4,919,767	0	0	303,368.7	17	1,512	0.0	0	0
70 - 75	743.6	1	52	-5,271,178	0	7	325,038.0	0	0	0.0	0	0
75 - 80	793.1	0	15	-5,622,590	0	10	346,707.2	0	0	0.0	0	0
80 - 85	842.7	0	19	-5,974,002	0	3	368,376.3	1	75	0.0	0	0
85 - 90	892.3	0	0	-6,325,414	0	0	390,045.5	0	4	0.0	0	0
90 - 95	941.8	0	0	-6,676,825	0	0	411,714.8	1	71	0.0	0	0
95 - 100	991.4	0	0	-7,028,237	0	0	433,383.9	4	354	0.0	0	0
Hours Off	0.0	0	338	0	0	6,173	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS													
	ELEC	102756	92885	108274	98504	105515	104064	99955	108274	98504	105515	98587	99955	1,222,789
	PK	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	23659	22896	23659	23659	22896	23659	0	0	140,429
	PK	0.0	0.0	0.0	0.0	31.8	31.8	31.8	31.8	31.8	31.8	0.0	0.0	31.8
2		BASE UTILITY												
	CHILLD	0	0	0	0	1265	1224	1265	1265	1224	1265	0	0	7,507
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	1.7
3		BASE UTILITY												
	CHILLD	0	0	0	0	223	216	223	223	216	223	0	0	1,325
	PK	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.3
4		BASE UTILITY												
	CHILLD	0	0	0	0	298	288	298	298	288	298	0	0	1,766
	PK	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5		BASE UTILITY												
	CHILLD	0	0	0	0	1265	1224	1265	1265	1224	1265	0	0	7,507
	PK	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	1.7
6		BASE UTILITY												
	CHILLD	0	0	0	0	1042	1008	1042	1042	1008	1042	0	0	6,182
	PK	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	1.4
7		BASE UTILITY												
	CHILLD	0	0	0	0	1116	1080	1116	1116	1080	1116	0	0	6,624
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
8		BASE UTILITY												
	HOTLD	972	878	972	941	0	0	0	0	0	0	941	972	5,678
	PK	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3
9		BASE UTILITY												
	HOTLD	135	122	135	130	0	0	0	0	0	0	130	135	786
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
10		BASE UTILITY												
	HOTLD	45	41	45	44	0	0	0	0	0	0	44	45	265
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
11		BASE UTILITY												
	HOTLD	69	62	69	67	0	0	0	0	0	0	67	69	404
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
12		BASE UTILITY												
	HOTLD	206	186	206	199	0	0	0	0	0	0	199	206	1,203
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
13		BASE UTILITY												
	HOTLD	44	40	44	42	0	0	0	0	0	0	42	44	256
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1	EQ1001L	2-STG CENTRIFUGAL CHILLER >550 TONS												
	ELEC	0	0	0	0	171488	195652	225523	238629	189294	69200	0	0	1,089,786
	PK	0.0	0.0	0.0	0.0	572.0	579.7	594.1	600.1	586.1	418.5	0.0	0.0	600.1
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	22171	21456	22171	22171	21456	11391	0	0	120,817
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	816	932	1064	1120	889	275	0	0	5,096
	PK	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.1	0.0	0.0	2.6
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	55502	53712	55502	55502	53712	55502	0	0	329,433
	PK	0.0	0.0	0.0	0.0	74.6	74.6	74.6	74.6	74.6	74.6	0.0	0.0	74.6
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	27751	26856	27751	27751	26856	27751	0	0	164,717
	PK	0.0	0.0	0.0	0.0	37.3	37.3	37.3	37.3	37.3	37.3	0.0	0.0	37.3
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
2	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	312	3960	11525	13456	16126	17208	12636	2979	193	0	78,396
	PK	26.2	26.2	34.7	55.3	75.4	78.8	81.6	81.0	75.7	51.6	37.6	26.2	81.6
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	202	548	1637	1584	1637	1637	1584	1637	132	0	10,597
	PK	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	92	249	744	720	744	744	720	744	60	0	4,817
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	EQ1172L	AIR-CLD COND COMP >55 TONS												
	ELEC	2730	2187	4913	6794	9935	11277	13167	13023	10529	6695	4766	2772	88,789
	PK	13.9	13.4	17.0	19.7	24.2	26.9	29.2	29.0	25.8	20.0	16.7	13.6	29.2
3	EQ5200	CONDENSER FANS												
	ELEC	135	103	311	515	781	899	1144	1042	851	483	301	140	6,705
	PK	0.7	0.6	1.3	1.6	1.9	2.1	2.9	2.9	2.0	1.7	1.3	0.7	2.9
3	EQ5313	CONTROLS												
	ELEC	167	151	223	216	223	216	223	223	216	223	216	186	2,485
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
4	EQ1130L	WTR-CLD CONDENSER COMPRESSOR > 30 TONS												
	ELEC	1158	851	3168	4527	7190	8383	9524	10367	7646	4449	2747	1070	61,080
	PK	19.8	22.4	27.5	31.9	34.2	34.7	35.5	35.8	35.0	31.5	29.5	24.0	35.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
4	EQ5200	CONDENSER FANS												
	ELEC	39	26	120	196	314	367	465	446	331	178	105	34	2,622
	PK	0.9	0.8	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.9	1.5
4	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	191	153	309	335	1116	1080	1116	1116	1080	1116	264	162	8,037
	PK	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
4	EQ5302	CONTROLS												
	ELEC	13	10	21	22	74	72	74	74	72	74	18	11	536
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	ACC2	TYPICAL AIR COOLED RECIP CHILLER												
	ELEC	0	0	0	0	13436	14833	17082	18542	13107	7784	0	0	84,785
	PK	0.0	0.0	0.0	0.0	66.5	69.5	72.1	71.5	66.8	58.1	0.0	0.0	72.1
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	2232	2160	2232	2232	2160	2232	0	0	13,248
	PK	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0	3.0
5	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	744	720	744	744	720	744	0	0	4,416
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
5	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	1116	1080	1116	1116	1080	1116	0	0	6,624
	PK	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	1.5
6	EQ1130L	WTR-CLD CONDENSER COMPRESSOR > 30 TONS												
	ELEC	0	0	0	0	7671	11047	14149	15529	10541	2105	0	0	61,043
	PK	0.0	0.0	0.0	0.0	80.7	82.6	83.7	84.5	82.6	42.4	0.0	0.0	84.5
6	EQ5200	CONDENSER FANS												
	ELEC	0	0	0	0	178	268	532	392	255	41	0	0	1,667
	PK	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	1.0	0.0	0.0	2.2
6	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	2753	2664	2753	2753	2664	2753	0	0	16,339
	PK	0.0	0.0	0.0	0.0	3.7	3.7	3.7	3.7	3.7	3.7	0.0	0.0	3.7
6	EQ5302	CONTROLS												
	ELEC	0	0	0	0	74	72	74	74	72	74	0	0	442
	PK	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]



## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

## EQUIPMENT ENERGY CONSUMPTION

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5	EQ5311	BOILER CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6		STEAM BOILER												
	GAS	210	191	112	108	0	0	0	0	0	0	111	206	939
	PK	2.0	2.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.0	2.0
6	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7		WATERTUBE BOILER												
	GAS	246	227	92	89	0	0	0	0	0	0	93	239	986
	PK	4.2	4.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.4	4.2	4.2
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	78	71	74	72	0	0	0	0	0	0	72	79	448
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
7	EQ5311	BOILER CONTROLS												
	ELEC	49	45	47	45	0	0	0	0	0	0	45	50	280
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
7	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	223	202	223	216	0	0	0	0	0	0	216	223	1,303
	PK	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
8		WATERTUBE BOILER												
	GAS	956	1010	547	272	0	0	0	0	0	0	466	1023	4,273
	PK	7.5	7.5	5.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	5.6	7.5	7.5
8	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1637	1478	1637	1584	0	0	0	0	0	0	1584	1637	9,557
	PK	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2
8	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO M - WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
9		WATERTUBE BOILER												
	GAS	11	16	0	0	0	0	0	0	0	0	0	14	41
	PK	1.6	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.5
9	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	18	20	0	0	0	0	0	0	0	0	0	13	51
	PK	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2
9	EQ5311	BOILER CONTROLS												
	ELEC	1	1	0	0	0	0	0	0	0	0	0	1	3
	PK	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
10		WATERTUBE BOILER												
	GAS	145	137	66	57	0	0	0	0	0	0	67	143	616
	PK	2.6	2.6	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.6	2.6
10	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1443	1358	1376	1332	0	0	0	0	0	0	1332	1439	8,281
	PK	3.7	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7	3.7
10	EQ5311	BOILER CONTROLS												
	ELEC	49	46	47	45	0	0	0	0	0	0	45	49	280
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO N1 - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	24	20	33	46	132	143	192	185	158	227	31	23	1,213
	PK	0.1	0.1	0.2	0.3	1.0	1.0	1.0	1.0	1.0	1.0	0.2	0.1	1.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	18476	16688	22171	21456	12129	9715	11473	11741	11771	19698	21456	19400	196,173
	PK	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	9238	8344	11086	10728	6064	4857	5736	5871	5886	9849	10728	9700	98,087
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	620	560	744	720	407	326	385	394	395	661	720	651	6,583
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1008L	3-STG CENTRIFUGAL > 300 TONS												
	ELEC	0	0	0	0	75815	102125	126646	133974	90729	11379	0	0	540,670
	PK	0.0	0.0	0.0	0.0	284.6	288.9	297.6	301.2	292.8	261.2	0.0	0.0	301.2
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	7087	8556	9691	10081	7533	1544	0	0	44,491
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	566	745	902	943	656	95	0	0	3,907
	PK	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	2.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	381	460	521	542	405	83	0	0	2,392
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
ECO N2 - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	102756	92885	108274	98504	105515	104064	99955	108274	98504	105515	98587	99955	1,222,789
	PK	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	0	0	0	0	28867	27936	28867	28867	27936	28867	0	0	171,341
	PK	0.0	0.0	0.0	0.0	38.8	38.8	38.8	38.8	38.8	38.8	0.0	0.0	38.8
2		BASE UTILITY												
	CHILLD	3571	3226	3571	3456	0	0	0	0	0	0	3456	3571	20,851
	PK	4.8	4.8	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8	4.8
1	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	1583	1272	2767	5499	17583	18928	25855	24365	21129	31839	2472	1456	154,748
	PK	21.8	20.3	28.6	36.7	154.0	154.0	154.0	154.9	154.0	153.7	28.3	21.8	154.9
1	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	420	656	1216	1337	672	700	0	0	5,000
	PK	0.0	0.0	0.0	0.0	10.9	11.8	13.5	14.9	12.6	11.5	0.0	0.0	14.9

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4

## ECO N2 - WATERSIDE SYSTEMS

## ----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	20	17	29	42	130	142	190	183	156	227	27	20	1,183
	PK	0.1	0.1	0.2	0.3	1.0	1.0	1.0	1.0	1.0	1.0	0.2	0.1	1.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	18476	16688	22171	21456	12129	9715	11473	11741	11771	19698	21456	19400	196,173
	PK	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	9238	8344	11086	10728	6064	4857	5736	5871	5886	9849	10728	9700	98,087
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	620	560	744	720	407	326	385	394	395	661	720	651	6,583
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1009	3-STG CTV WITH VARIABLE FREQUENCY DRV												
	ELEC	0	0	0	0	75826	102434	126975	133133	89633	12170	0	0	540,171
	PK	0.0	0.0	0.0	0.0	300.0	300.0	300.0	301.7	300.0	300.0	0.0	0.0	301.7
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	2914	4598	6406	7185	4432	101	0	0	25,637
	PK	0.0	0.0	0.0	0.0	13.6	14.7	16.9	18.6	15.7	11.8	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	566	745	903	942	655	96	0	0	3,907
	PK	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	2.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	381	460	521	542	405	83	0	0	2,392
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0



## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
ECO N3 - WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	21	18	30	45	132	143	192	184	158	230	28	21	1,204
	PK	0.1	0.1	0.2	0.3	1.0	1.0	1.0	1.0	1.0	1.0	0.2	0.1	1.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	18476	16688	22171	21456	12129	9715	11473	11741	11771	19698	21456	19400	196,173
	PK	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	9238	8344	11086	10728	6064	4857	5736	5871	5886	9849	10728	9700	98,087
	PK	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	620	560	744	720	407	326	385	394	395	661	720	651	6,583
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	YSCRW22	YORK W.C. SCREW CHILLER												
	ELEC	0	0	0	0	83875	115385	144525	152851	102274	11933	0	0	610,843
	PK	0.0	0.0	0.0	0.0	332.6	337.2	346.2	349.0	341.2	308.3	0.0	0.0	349.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	7087	8556	9691	10081	7533	1544	0	0	44,491
	PK	0.0	0.0	0.0	0.0	18.6	18.6	18.6	18.6	18.6	18.6	0.0	0.0	18.6
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	573	757	918	960	667	95	0	0	3,971
	PK	0.0	0.0	0.0	0.0	2.0	2.1	2.1	2.1	2.1	2.0	0.0	0.0	2.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	0	0	0	0	11354	13708	15526	16152	12069	2473	0	0	71,282
	PK	0.0	0.0	0.0	0.0	29.8	29.8	29.8	29.8	29.8	29.8	0.0	0.0	29.8
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	381	460	521	542	405	83	0	0	2,392
	PK	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0

## ECO N4 - WATERSIDE SYSTEMS

## EQUIPMENT ENERGY CONSUMPTION

[illegible]

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO N4 - WATERSIDE SYSTEMS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ5100	COOLING TOWER FANS												
	WATER	22	19	34	51	1114	1284	1481	1570	1222	406	31	21	7,254
	PK	0.1	0.2	0.3	0.4	4.0	4.0	4.0	4.0	4.0	3.0	0.3	0.2	4.0
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	12471	10728	16762	20160	33257	32184	33257	33257	32184	33257	15913	11845	285,276
	PK	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	12471	10728	16762	20160	33257	32184	33257	33257	32184	33257	15913	11845	285,276
	PK	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	279	240	375	451	744	720	744	744	720	744	356	265	6,382
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1		HEATER FOR ENGINE DRIVEN CHILLER												
	ELEC	70	65	55	40	0	0	0	0	0	0	55	72	357
	PK	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO O - WATERSIDE SYSTEMS

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS													
	ELEC	102756	92885	108274	98504	105515	104064	99955	108274	98504	105515	98587	99955	1,222,789
	PK	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8	587.8
1	MISC LD													
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	HOTLD	1472	1329	1472	1424	0	0	0	0	0	0	1424	1472	8,592
	PK	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0
1		HIGH EFFICIENCY MODULAR FIRETUBE BOIL.												
	GAS	7423	7363	3053	1786	0	0	0	0	0	0	2960	6995	29,581
	PK	20.0	20.0	8.6	4.4	0.0	0.0	0.0	0.0	0.0	0.0	9.2	20.0	20.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	8333	7526	8333	8064	0	0	0	0	0	0	8064	8333	48,653
	PK	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2	11.2
1	EQ5311	BOILER CONTROLS												
	ELEC	93	84	93	90	0	0	0	0	0	0	90	93	543
	PK	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO 0 - WATERSIDE SYSTEMS

## ----- EQUIPMENT ENERGY CONSUMPTION -----

[illegible]